

MUSEUM.

FROM THE BRITISH CRITIC.

The Works of John Playfair, Esq. late Professor of Natural Philosophy in the University of Edinburgh, &c. &c. With a Memoir of the Author. Constable & Co. Edinburgh, 1822.

With the usual aversion entertained and professed by critics for the vile art of book-making, we are, notwithstanding, disposed to allow that this is one of the books which deserved to be made. The most valuable of Mr. Playfair's treatises, the "Illustrations of the Huttonian Theory," had been many years out of print; and his other essays, biographical and scientific, were only to be found in very expensive collections, such as the Transactions of Philosophical Societies, or the equally inaccessible pages of modern Encyclopædias.

Mr. Playfair was the son of a Scotch minister, and was born in 1748. He received his education at St. Andrew's, where, at the age of sixteen or seventeen, he was selected by Professor Wilkie, who happened to be confined by illness, to read his lectures on natural philosophy. When only in his eighteenth year he stood candidate for the mathematical professorship in the Marischal College of Aberdeen; on which occasion he sustained, with great credit, a comparative trial, which continued eleven days, yielding only to the superior attainments of Dr. Trail, the present Chancellor of Down and Connor, in Ireland, and of Dr. Hamilton, the well known author of a very profound work on the national debt, who is at this moment in possession of the chair which called forth so ardent a competition.

The death of his father determined the choice of young Playfair in favour of the ecclesiastical profession: and in due time the charge and emoluments of his native parish were secured to him by the kindness of his patron, Lord Gray. After about ten years' residence in the country, where, we are told, he devoted the chief part of his time to the duties of his cure and the composition of sermons, he found himself induced, by very advantageous offers, to resign his living, for the purpose of superintending the education of two young men, the sons of a Fifeshire squire of considerable fortune. In company with his pupils, who, we find, were Mr. Ferguson, of Raith, and his brother, Sir Ronald Ferguson, the existing M. P. for Kirkcaldy, the rector of Benvie repaired to Edinburgh, to attend the lectures which are annually delivered there, on every subject of human interest or curiosity; and where he soon made himself so well known, by his great abilities and learning, that, in 1785, he was nominated, by the patrons of the college, joint-professor of mathematics, a situation in which he remained about twenty years. In 1805, the death of Professor Robinson led to his preferment, if such it can be called, to the chair of natural philosophy, a position which he held and adorned, with much talent and a large share of popular approbation, till the period of his demise in the year 1819.

There is, appended to the memoir, a sketch of Mr. Playfair's cha-

acter, furnished by Mr. Jeffery, the editor of the *Edinburgh Review*. As this writer, however, is avowedly no competent judge of the works of the Professor, his remarks, as far as they are literary, respect rather the manner of composition and the qualities of style which distinguished Mr. P., than the subjects themselves which engaged his powerful mind: and thus, whilst we admire the eloquence and the affectionate regard which animate this biographical outline, we desiderate, on the part of the author, the scientific knowledge which was necessary to place in a proper light the attainments and performances of his deceased friend. Mr. Playfair, we are told, wrote slowly, his first sketches being usually very slight and imperfect, like the rude chalking of a masterly picture. His chief art and great pleasure was in their revisal and correction: and there was no limits to the improvement which resulted from this application.

"As he never wrote upon any subject of which he was not perfectly master, he was secure against all blunders in the substance of what he had to say; and felt quite assured that if he was only allowed time enough, he should finally come to say it in the very best way of which he was capable. He had no anxiety, therefore, either in undertaking or proceeding with his tasks; and intermitted and resumed them at his convenience with the comfortable certainty that all the time he bestowed on them was turned to good account, and that what was left imperfect at one sitting might be finished with equal ease and advantage at another. Being thus perfectly sure, both of his end and his means, he experienced, in the course of his compositions, none of that little fever of the spirits with which that operation is so apt to be accompanied. He had no capricious visitings of fancy which it was necessary to fix on the spot or to lose for ever—no casual inspirations to invoke and wait for—no transitory and evanescent lights to catch before they faded. All that was in his mind was subject to his control and amenable to his call, though it might not obey at the moment; and while his taste was so sure that he was in no danger of over-working any thing that he had designed, all his thoughts and sentiments had that unity and congruity that they fell almost spontaneously into harmony and order; and the last added, incorporated, and assimilated with the first as if they had sprang simultaneously from the same happy conception."

There can be no doubt that the style of Professor Playfair was extremely well adapted to scientific discussions. It was clear, natural, and unburdened with unnecessary ornament. Having, on all occasions, a distinct conception of what he meant to say, he used the exact number of words requisite to convey his meaning; and never added a trifling thought, or even repeated an important one, merely to give his sentences the full turn and sonorous termination which, in the opinion of some of his countrymen, seem indispensable to fine writing. Most Scotchmen write English as if it were to them a foreign language; and thus, however well they may succeed in historical or scientific composition, they never become masters of those graces and felicities of style which arise from the successful application of the more idiomatic arrangement of words and phrases, to which the ear of his southern neighbour is accustomed from his infancy. In grave and solemn performances, it will be admitted, a certain departure from the colloquial forms of speech is attended with considerable advantage; and in the departments of theology, for example, as well as in all the higher branches of science, we are warranted in allowing, and even in encouraging, the distinction between a spoken language and a written language. In proportion, then, as literary composition is permitted to differ from the ease of conversa-

tion and the freedom of oratory, excellence in it will be more within the reach of those who study our language in books, and write it according to grammatical rules: and there is no doubt that it is on this very account such authors as Mr. Playfair become a sort of model for an elegant philosophical style, intelligible alike to the native Englishman and to the learned foreigner. The "Illustrations of the Huttonian Theory" have been universally admired as a specimen of fine composition on a philosophical subject. Even the Wernerians, who question the principles and abjure the conclusions of that ingenious treatise, acknowledge it to be a beautiful and most fascinating geological romance.

"But," says Mr. Jeffery, "we need dwell no longer on qualities that may be gathered hereafter from the works he has left behind him. Those who lived with him mourn the most for those which will be traced in no such memorial; and prize, far above those talents which gave him his high name in philosophy, that personal character which endeared him to his friends, and shed a grace and a dignity over all the society in which he moved. The same admirable taste which is conspicuous in his writings, or rather the higher principles from which that taste was but an emanation, spread a similar charm over his whole life and conversation; and gave to the most learned philosopher of his day the manners and deportment of the most perfect gentleman. Nor was this in him the result merely of good sense and of good temper, assisted by an early familiarity with good company, and a consequent knowledge of his own place and that of all around him. His good breeding was of a higher descent, and his powers of pleasing rested on something better than mere companionable qualities. With the greatest kindness and generosity of nature he united the most manly firmness and the highest principles of honour,—and the most cheerful and social dispositions with the gentlest and steadiest affections. Towards women he had always the most chivalrous feelings of regard and attention, and was, beyond almost all men, acceptable and agreeable in their society, though without the levity or pretension unbecoming his age or condition. And such, indeed, was the fascination of the most perfect simplicity and mildness of his manners, that the same tone and deportment seemed equally appropriate to all societies, and enabled him to delight the young and the gay with the same sort of conversation which enabled him to instruct the learned and the grave. There never, indeed, was a man of learning and talent who appeared in society so perfectly free from all sorts of pretension or notion of his own importance, or so little solicitous to distinguish himself, or so sincerely willing to give place to every one else. Even upon subjects which he had thoroughly studied he was never in the least impatient to speak, and spoke at all times without any tone of authority; while, so far from wishing to set off what he had to say by any brilliancy or emphasis of expression, it seemed, generally, as if he had studied to disguise the weight and originality of his thoughts under the plainest form of speech and the most quiet and indifferent manner; so that the profoundest remarks and subtlest observations were often dropped, not only with no solicitude that their value should be observed, but without any apparent consciousness that they possessed any. Though the most social of human beings, and the most disposed to encourage and to sympathize with the gaiety and the joviality of others, his own spirits were, in general, rather cheerful than gay, or, at least, never rose to any turbulence or tumult of merriment: and while he would listen with the kindest indulgence to the more extravagant sallies of his younger friends, and prompt them by his heartiest approbation, his own satisfaction might generally be traced in a slow and temperate smile, gradually mantling over his benevolent and intelligent features, and lighting up the countenance of the sage with the expression of the mildest and most genuine philanthropy. It was wonderful, indeed, considering the measure of his own intellect, and the rigid and undeviating propriety of his own conduct, how tolerant he was of the defects and errors of other men. He was too indulgent, in truth, and favourable to his friends,—and made a kind and liberal allowance for the faults of all mankind, except only faults of baseness or of cruelty, against which he never failed to manifest the most open scorn and detestation. Independent, in short, of his high attainments, Mr. Playfair was one of the most amiable and estimable of men; delightful in his manners, inflexi-

ble in his principles, and generous in his affections, he had all that charms in society or attaches in private: and while his friends enjoyed the free and unstudied conversation of an easy and intelligent associate, they had, at all times, the proud and inward assurance that he was a being upon whose perfect honour and generosity they might rely with the most implicit confidence in life and in death,—and of whom it was equally impossible that, under any circumstances, he should ever perform a mean, a selfish, or a *questionable* action, as that his body should cease to gravitate, or his soul to live.”

At the close of the biographical account, we find a “*Journal*,” containing a short but very entertaining retrospect of a visit which the Professor paid to London in the year 1782, and of his introduction to several of the leading characters, which at that period figured in this metropolis. The first person he mentions is the late Dr. Maskelyne, the astronomer royal, with whom he had formerly spent some time, when engaged in his experiments on the mountain Schehallien in Perthshire; and who gave him so cordial a reception, that he could not allow himself to doubt, that “an acquaintance formed among wilds and mountains is much more likely to be durable than one made up in the bustle of a city.” The astronomer, it seems, had been suspected of sometimes detracting from the discoveries of others, when they interfered with his own; but Mr. Playfair declares he could never perceive any thing of this kind, though he saw him placed in one of those critical situations where envy and jealousy, had they lurked any where within him, could scarcely have failed to make their appearance. The other personages with whom the stranger came chiefly in contact, were Dr. Horsley, Dr. Solander, Mr. Cavendish, Mr. Smeaton, and Drs. Price and Priestley. Of the last mentioned individual, his estimate is so correct and so well expressed, that we take the liberty to quote it at length for the amusement of the reader.

“Mr. Vaughan and his father are both of them Dissenters, and at their house I often found all the chief men of that interest assembled, Dr. Price, Priestley, Kippis, Tours, and a number of others. To be a Scotsman was far, I soon found, from being any recommendation to these gentlemen, and they seemed to look on the members of every established church with contempt or abhorrence. The manners of Dr. Price were the softest by far of any among them, and I found myself easiest in his company. He is certainly a good mathematician, but politics at present occupy all his thoughts.

“Dr. Priestley has made so great a figure in the world that my anxiety to see him was very great: but his conversation has nothing in it very remarkable. When politics are the subject of discourse he has the same violence with his brethren, and savours not much either of soundness of head or extent of information. On the subjects of chemistry and the doctrine of fixed air, he talked indeed with a great deal of acuteness, and like a man that had been long conversant with experimental philosophy. He is very sanguine in the forming of theories, which he does very often without sufficient data, a fault that is perhaps compensated by the facility with which he afterwards abandons them. On the whole, from Dr. Priestley’s conversation and from his writings, one is not much disposed to consider him as a person of first-rate abilities. The activity, rather than the force of his genius, is the object of admiration. He is indefatigable in making experiments, and he compensates by the number of them for the unskilfulness with which they often are contrived, and the hastiness with which conclusions are drawn from them. Though little skilled in mathematics, he has written on optics with considerable success; and though but moderately versed in chemistry, he has rendered very considerable service to that science. If we view him as a critic, a metaphysician, and a divine, we must confine ourselves to more scanty praise. In his controversy with Dr. Reid, though he said many things that are true, he has shown himself wholly incapable of understanding the principal point in debate; and

when he has affirmed, that the vague and unsatisfactory speculations of Hartley have thrown as much light on the nature of man, as the reasonings of Sir Isaac Newton did on the nature of body, he can scarcely be allowed to understand in what true philosophy consists. As to his theology, it is enough to say that he denies the immateriality of the soul, though he contends for its immortality, and arranges himself on the side of Christianity. These inconsistencies and absurdities will perhaps deprive him of the name of a philosopher, but he will still merit the name of a useful and diligent experimenter."

When the peace of Europe had been completely re-established by the victory of Waterloo, Mr. Playfair undertook a journey into France, Switzerland, and Italy, with the view of collecting materials for a new edition of his "*Illustrations of the Huttonian Theory*," a work which he unfortunately did not live to accomplish. Of the facts which he noted and determined, in the course of his travels, we may perhaps give a short account hereafter; meantime we proceed to lay before our readers an abridged description of the Slide of Alpnach, one of the most surprising mechanical contrivances that reward the ingenuity of the present age.

From the reports of the Chamois hunters employed in the Swiss canton of Unterwalden, it was ascertained that there were immense forests of the finest timber spread out on the mountains, particularly on the south side of Pilatus; but in a situation which the height, the steepness, and the ruggedness of the ground, seemed to render quite inaccessible. Mr. Rupp, a native of Wirtemberg, and a very skilful engineer, then resident in the canton of Schwytz, was induced to visit the locality in question; and he was so much struck with the appearance of the forest, that he conceived the bold project of bringing down the trees by no other force than their own weight into the lake of Lucerne, from which the conveyance to the German ocean would be easy and expeditious. The medium height of the forest is about 2500 feet; and the horizontal distance which the trees had to be conveyed, from the spot where they grew to the lake into which they were to be launched, was eight miles and about three furlongs. The declivity is therefore one foot in 17.68: the medium angle of elevation $3^{\circ} 14' 20''$.

This declivity, though so moderate on the whole, is, we are told, in many places very rapid: at the beginning the inclination is about one-fourth of a right angle, or $22^{\circ} 30'$; in many places it is 20° ; but no where greater than the angle first mentioned, $22^{\circ} 30'$. The inclination continues of this quantity for 500 feet, after which the way is less steep, and often considerably circuitous, according to the direction which the ruggedness of the ground forces it to take.

The Slide in question consists of a sort of trough, built after the form of a cradle, and extending from the forest to the edge of the lake. Three trees squared, and laid side by side, form the bottom of the trough; the tree in the middle having its surface hollowed, so that a rill of water received from distance to distance may be conveyed along the bottom and preserve it moist. Adjoining to the central part of the trough, other trees also squared are laid parallel to the former, in such a manner as to form a trough rounded in the interior, and of such dimensions as to allow the largest trees to lie or to move along quite readily. In general it is from five to six feet wide at top, and from three to four in depth, varying, however, in different places according to circumstances. In all it contains about thirty

thirty thousand trees; crosses in its way three great ravines, one at the height of 64 feet, another at the height of 103, and the third, where it goes along the face of a rock, at the height of 157; and in two places it is conveyed under ground.

The trees which descend by this conveyance are spruce firs, very straight, and of great size. All the branches are lopped off; the bark is stripped away, and the surface of course made tolerably smooth. The logs, too, of which the trough is composed, are dressed with the axe, so as to remove all considerable inequalities, and to facilitate the passage of the trees; which, being placed in it with the root end foremost, are launched off in the direction of the lake. As the declivity of the trough at the upper part is very great, the tree in a few seconds acquires such a velocity as enables it to reach the water in the short space of six minutes; a result, as Mr. Playfair observes, altogether astonishing, when it is considered that the distance is more than eight miles, that the average declivity is but one foot in seventeen, and that the route which the trees have to follow is often circuitous, and in some places almost horizontal.

"We saw five trees come down; the place where we stood was near the lower end, and the declivity was inconsiderable, (the bottom of the Slide nearly resting on the surface of the ground,) yet the trees passed with astonishing rapidity. The greatest of them was a spruce fir, a hundred feet, four feet in diameter at the lower end, and one foot at the upper. The greatest trees are those which descend with the greatest rapidity; and the velocity as well as the roaring of this one was evidently greater than of the rest. A tree must be very large to descend at all in this manner: a tree, Mr. Rupp informed us, that was only half the dimensions of the preceding, and therefore only an eighth part of its weight, would not be able to make its way from the top to the bottom. One of the trees that we saw, broke by some accident into two; the lighter part stopped almost immediately, and the remaining part came to rest soon after. This is a valuable fact: it appears from it that the friction is not in proportion to the weight, but becomes relatively less as the weight increases, contrary to the opinion that is generally received.

"In viewing the descent of the trees, my nephew and I stood quite close to the edge of the trough, not being more interested about any thing than to experience the impression which the near view of so singular an object must make on a spectator. The noise, the rapidity of the motion, the magnitude of the moving body, and the force with which it seemed to shake the trough as it passed, were altogether very formidable, and conveyed an idea of danger much greater than the reality. Our guide refused to partake of our amusement; he retreated behind a tree at some distance, where he had the consolation to be assured by Mr. Rupp, that he was no safer than we were, as a tree when it happened to bolt from the trough, would often cut the standing trees clear over. During the whole time the Slide has existed, there have been three or four fatal accidents, and one instance was the consequence of excessive temerity."

The trees thus brought down into the lake of Lucerne, are formed into rafts, and floated down the very rapid stream of the Reuss, by which the lake discharges its waters first into the Aar, and afterwards into the Rhine. By this conveyance, which is all of it in streams of great rapidity, the trees sometimes reach Basle in a few days after they have left Lucerne; and there the immediate concern of the Alpnach company terminates. They are afterwards navigated down the Rhine in rafts to Holland, and are afloat in the German ocean in less than a month from the time they descended from the side of Pilatus, a very inland mountain, not less than a thousand miles distant. We know not the amount of success which, in a pecuniary point of view,

has attended the speculation of Mr. Rupp; but, at one time, Bonaparte contracted for all the timber which he could send to the Rhine, and thereby prevented at least a stagnation of the commodity.

There are several scientific considerations connected with the facts now detailed, which seem to have puzzled Mr. Playfair not a little, and which, indeed, weighed with him so far as to make him refuse his consent to have his paper inserted in the Transactions of the Society, before whom it was read. The rapidity of the descent, so much greater than could possibly have been anticipated, is not he thought easily to be reconciled with the notions concerning friction, that are usually received even in the scientific world. It appears, however, that Professor Playfair was not familiarly acquainted with the most recent notions concerning friction entertained among practical engineers, and particularly with the fine experiments of the French writer, Coulomb: and consequently, whilst reasoning on the subject, hazarding his conjectures, and proposing his solutions, he was not aware that what appeared to him perfectly new, had been long received as established principles among men engaged in practical mechanics. It is pleasing, at the same time, to observe, that the inferences which the Professor draws from the facts before him, by means of mathematical reasoning, are substantially the same with those which experience has pointed out to less scientific persons; for the conclusions at which he has arrived, through a process of deep calculation, are found to coincide astonishingly well with the practical maxims of the ship-builder, when he launches a vessel from the slips, and with the operations of the engineer, in the movement of very heavy bodies on an inclined plane. In short, it seems to be now perfectly established, that heavy bodies when put in motion on an inclined plane, are relatively less retarded by friction than lighter ones are: and secondly, that friction, in all cases, is diminished in proportion as the velocity of the sliding is increased. What the precise *ratio* is at which the friction is lessened relatively to the augmented velocity is, we believe, a point not yet clearly determined; but in regard to the fact itself, so little doubt is now entertained, that we are only astonished Mr. Playfair should have esteemed the announcement of it as a novelty in mechanics.

It is very true, however, as the Professor remarks, that we have here a strong instance of the danger of concluding in the researches of mechanics, from experiments made on a small scale, in regard to what should be the practice when applying the result to a large scale. When our experiments lead to the knowledge of a *fact* and not of a *principle*, there is the utmost caution requisite in extending the conclusions beyond the limits by which the experiments have been confined. And this is particularly the case with the experiments on friction, where we know only facts and have no principle to guide us; that is, we have not been able to connect the facts with any of the known and measurable properties of bodies.

"That friction belongs to the cases in which great caution is necessary in extending the conclusions of experiments, is indeed most strongly evinced by the operations that have now been described; the result of which is such as could not have been anticipated from these experiments. The danger here, however, is quite of an opposite kind from that which commonly takes place in such instances. The experiments on the small scale, usually represent the thing as more easy than it is upon the great, and engage us in attempts that prove abortive, and

are followed by disappointment and even ruin. In the present case, the experiments on the small scale represent the thing as more difficult than when tried on the great one it is found to be; and would lead us by an error the direct opposite of the last, to conclude things to be impracticable that may be carried into effect with ease. Had the ingenious inventor of the slide at Alpnach, been better acquainted with the received theories of friction, or the experiments on which they are founded, even those that are the best and on the greatest scale, such as those of another most skilful engineer, M. Coulomb, or had he placed more faith in them, he never would have attempted the great work, in which he has so eminently succeeded."

It appears, however, in fact, that Mr. Rupp, the inventor of the slide at Alpnach, was much better acquainted than Professor Playfair with the received theories of friction, and in particular, we may be allowed to suppose, with the improved views derived from the ingenious experiments of Coulomb; and, moreover, that it was because he had faith in the received theories, so modified and confirmed, that he engaged in the immense enterprise which is likely to hand down his name to posterity, as one of the most enlightened engineers of the nineteenth century.

The volumes now given to the world as the works of Mr. Playfair, contain his "Illustrations of the Huttonian Theory;" the "Dissertation on Physical Science," published in the Supplement to the *Encyclopædia Britannica*; a variety of papers originally printed in the *Transactions of the Royal Societies of London and Edinburgh*; and, lastly, a selection from the articles which he contributed to the *Edinburgh Review*. The "Dissertation exhibiting a general View of Mathematical and Physical Science since the Revival of Letters in Europe," is worthy of the author's name; but unfortunately, owing to his death before the materials could be finally prepared for the press, it remains in an unfinished state, and must for ever continue in the shape of a mere fragment.

One of the last things Mr. Playfair wrote, and with which he seems to have amused himself during part of the time he was confined with illness, is a Memoir relating to Naval Tactics, as improved by the late John Clerk of Eldin.

It is a singular incident in the history of human affairs, that a person who had never been at sea in his life, should have introduced into military seamanship the most important improvement which that difficult art has received in modern times. From his early youth, a fortunate instinct seems to have directed his mind to this line of study.

"I had," says he, in a document referred to by Mr. Playfair, "acquired a strong passion for nautical affairs when a mere child. At ten years old, before I had seen a ship, or even the sea at a less distance than four or five miles, I formed an acquaintance at school with some boys who had come from a distant sea-port, who instructed me in the different parts of a ship, from a model which they had procured. I had afterwards frequent opportunities of seeing and examining ships at the neighbouring port of Leith, which increased my passion for the subject; and I was soon in possession of a number of models, many of them of my own construction, which I used to sail on a piece of water in my father's pleasure grounds, where there was also a boat with sails, which furnished me with much employment. I had studied *Robinson Crusoe*, and I read all the sea voyages I could procure."

Upon the commencement of the American war, Mr. Clerk, who continued to pay the utmost attention to the subject of naval tactics, and derived all the knowledge he could possibly acquire from read-

ing and conversation, and particularly from studying the details of the several actions which took place between the belligerents, saw more and more reason to suspect that there was something very erroneous in the method heretofore pursued by the British admirals, for bringing their fleets into battle. He perceived, that while nothing could exceed the skill with which the ships individually were worked and manœuvred, the plan followed in bringing a whole fleet to meet the enemy was extremely uncertain and precarious: and, in a word, he was convinced from the conduct of our bravest and most skilful admirals, that an expedient for forcing their antagonists to fight, on equal terms, was an addition to the art of naval warfare that remained still to be discovered.

It had usually happened, that the British fleet was eager to engage, and that the enemy was unwilling to risk a general action; the object of our commanders, therefore, had almost always been to gain the *weather gage*, as it is called, of the enemy, or to place themselves to the windward of his fleet. When that fleet was drawn out in line, in the manner necessary for allowing every ship its share in the action, the British fleet bore down from the windward upon the enemy; who was so placed as to have his whole line, and also the broadside of each individual ship, nearly at right angles to the direction of the wind. In such circumstances, the British had usually adopted one of the two following methods, in order to make the attack. They either formed their fleet into a line parallel and directly opposite to that of the enemy, whence each ship bore down upon that which was immediately opposed to it; or, sailing on the tack opposite to that on which the enemy stood, ran along parallel to their line, and within fighting distance, till the whole of the one line was abreast of the other, and each ship ready to engage her antagonist.

If the former of these methods was pursued, each ship on coming down had to sustain a destructive fire from the broadside of the one immediately opposed to her in the enemy's line, which she could only return very ineffectually from the few guns mounted in her bows. The rigging, consequently, which presented the best mark, when the ship was moving *end on* before the wind, was in general so dreadfully cut by the enemy's shot, that the vessel was always much disabled, and sometimes rendered totally unmanageable, before she arrived within fighting distance.

If the second method was pursued, the headmost ship had to endure the fire of the whole line before she arrived in her place; the next, the fire of all but one; the third had to sustain the broadsides of all but two, and so on; so that it was very improbable that any, except the sternmost ships, could reach their station in the line without having received material damage. This mode of fighting, it requires not to be observed, would give to the enemy who remained quietly on the defensive, a great advantage over the attacking squadron, and enabled him almost to a certainty to maim his antagonist's fleet, with very little loss to himself, or even to gain a victory without exposing to any great hazard either his men or his ships.

"Mr. Clerk had the merit of pointing out the evils now enumerated, in a manner most clear and demonstrative, and of describing a method by which the attack might be made, without incurring any of the disadvantages that have been mentioned, and almost with a certainty of success. As the evil arose from an en-

deavour to diffuse the force of the attack, if one may say so, over the whole surface of the line attacked; so the remedy consisted in concentrating the force of the attack, and in bringing it to bear with proportionably greater energy on a single point, or a small portion of the enemy's line. For this purpose the admiral of the attacking and windward squadron is supposed to come down, not in a line, but with his fleet in divisions, so as to be able to support the particular division destined to break through the line of the enemy. The consequence must be, that if this attack is directed against the rear of the enemy, the ships ahead must either abandon those that are cut off, or must double back either by tacking or wearing. Mr. Clerk shows, that if the enemy follow the first of these methods, and make his line either tack in succession or altogether, such a distance must be left between them and the three or four sternmost ships, that not only must these last be easily carried, but that several more must probably be thrown into such a situation, as to subject them almost unavoidably to the same fate. If the enemy attempt the same thing by wearing, his condition will be still worse. The fleet by falling to leeward must not only desert the ships altogether, but must leave the sternmost of the wearing ships so much exposed, as to render it certain that they will be entirely cut off."

There can be no doubt that the system proposed and explained by Mr. Clerk was entitled to the full merit of originality. In his work he has entered into a historical detail which tends to establish this point, and in which, from the most authentic documents, he traces the plans of most of our remarkable naval actions, from that of Admiral Matthews, off Toulon, in 1744, to that of Admiral Greaves, off the Chesapeake, in 1781. In most of these actions we find, though conducted by some of our ablest naval officers, that the British fleet being to windward, and by extending the line of battle so as to destroy the whole of the enemy's line, which was of course, to leeward, was itself disabled, before the ships could reach a situation in which they could annoy their adversaries; while, on the other hand, the French perceiving the British ships in disorder, usually made sail, and after throwing in their whole fire, formed their line again to leeward, where they lay prepared for another attack, should their antagonists feel inclined to make it. In this way, campaign after campaign was frustrated, and baffled, and even defeated, that rare combination of skill and courage, which distinguishes the English seaman, and which was even then so conspicuous and successful in actions with single ships. The analysis and commentary which Mr. Clerk applies to these actions are very instructive to professional men, and form a scientific review of the naval history of Great Britain, which we should look for in vain in any of the treatises expressly written on that subject.

It was on the 12th of April, 1782, that the merits of Clerk's system were put to the trial and approved. The brave Rodney, who, like all able men, showed the utmost willingness to learn, even from a landsman, went to sea determined to avail himself of the new lights in his profession with which he had just been supplied. Before going out to take the command of the fleet in the West Indies, he said one day to Mr. Dundas, afterwards Lord Melville, "There is one Clerk, a countryman of yours, who has taught us how to fight, and appears to know more of the matter than any of us. If ever I meet the French fleet I intend to try his way." He did try it; and by his distinguished success set an example to succeeding admirals, which by bringing into full play the native strength and courage of British sailors, has swept from the ocean all the other navies of Europe, and secured for

our countrymen an ascendancy in nautical warfare, that no nation, ancient or modern, has ever possessed.

Dupin, whose work on the naval force of Great Britain, we noticed in our April number, has given a brief account of Rodney's victory, as the first application of Clerk's principles, and appreciated fully the value of the system which was thereby so powerfully recommended to our admirals.

"In the victory gained by Rodney over De Grasse," says he, "the former having cut through the other's line in the centre, and our rear division having yielded to the combined attack of the enemy's whole fleet, the English doubled back upon that portion of the centre which our rear had abandoned. Then the French admiral, with the ships around him, pressed by a superior force, and caught between two fires, were compelled to surrender. This was the most decisive battle since that of La Hogue."

Trafalgar, we may add, as Dupin himself allows, was a still more direct and brilliant exemplification of the same method of attack: and wonderful as that action was in every respect, there is nothing connected with it so surprising, as the stupid adherence of the French commander to his antiquated tactics. Whilst the centre was involved in inevitable destruction, from the combined onset of the whole British fleet, the wings remained inactive and immovable. *Ces ailes sont en ligne, et cela leur suffit: elles attendent donc avec une effrayante impassibilité que leur centre soit détruit; il l'est enfin. Alors oubliant leur pieux respect pour l'ordre sacré de la ligne, elles ne songent plus qu'à la retraite.*

That Lord Nelson did not disdain to study the work of a mere theorist, when completing his professional accomplishments, and even in arranging his plan of battle, is evident from the circumstance, mentioned here by Mr. Playfair, that in the very body of the instructions issued by his Lordship before the conflict at Trafalgar, there are several sentences entirely taken from the *Naval Tactics*. These instructions were transmitted to Mr. Clerk by Sir Philip Durham, one of the commanders in that memorable action, accompanied with the following note, which shows in what light his improvements were regarded by those who were the best able to decide upon their merits.

"Captain Durham, sensible of the many advantages which have accrued to the British nation, from the publication of Mr. Clerk's *Naval Tactics*, and particularly from that part of them which recommends breaking through the enemy's line, begs to offer him the enclosed form of battle, which was most punctually attended to in the brilliant and glorious action of the 21st of October. Mr. Clerk will perceive with pleasure, that it is completely according to his own notions, and it is now sent as a token of respect from Captain Durham to one who has merited so highly of his country. H. M. S. off Cadiz, 29th of October, 1805."

Mr. Playfair informs us that he had before him, whilst writing his remarks, a copy of the first part of the *Naval Tactics*, with notes on the margin by Lord Rodney himself, which had been communicated by the admiral to the late General Clerk, by whom it was deposited in the family library at Penicuik. These notes, it is said, are full of remarks on the justness of Mr. Clerk's views, and on the instances wherein his own conduct had been in strict conformity with those views. Rodney, (at that time Sir George) even condescends to answer some questions which Mr. Clerk had put in regard to the action off Martinique in the year 1780. The first signal of the Admi-

ral on that occasion was to attack the enemy's rear with the whole fleet. But the French perceiving this design, wore their ships and formed on the opposite tack; a movement which rendered it impossible to obey the first order, and the next that Rodney made was for every ship to attack her opposite. Mr. Clerk's question in return to these manœuvres was, why did Sir George change his resolution of attacking the rear, and order an attack on the whole line? Sir George answers to this, that he did not change his intention, but that his fleet disobeyed his signal, and forced him to abandon his plan.

"An anecdote which sets a seal on the great and decisive testimony of the noble Admiral, is worthy of being remembered; and I am glad to be able to record it on the authority of a noble earl. The present Lord Haddington met Lord Rodney at Spa, in the decline of life, when both his bodily and his mental powers were sinking under the weight of years. The great commander who had been the bulwark of his country and the terror of her enemies, lay stretched on his couch, while the memory of his own exploits seemed the only thing that interested his feelings, or afforded a subject for conversation. In this situation he would often break out in praise of the *Naval Tactics*; exclaiming with great earnestness, John Clerk of Eldin for ever! Generosity and candour seemed to have been such constituent elements in the mind of this gallant Admiral, that they were among the parts which longest resisted the influence of decay."

Mr. Playfair concludes his sketch with an expression of regret that no token of public gratitude has yet been conferred on the memory of Mr. Clerk. He is disposed to ascribe this omission to the fear of giving offence to the navy, and to consider it rather as resulting from an excess of caution than from direct or intentional neglect. It might seem to derogate from the glory of our naval officers to recognise a landsman as the author of one of the most valuable discoveries that had been made in their own art—as the person who had not only pointed out the new principle, but had completely unfolded its advantages and predicted its effects. But, continues he, to whatever cause the neglect of which I now complain is to be attributed, it is certain that the government and the navy have both lost a great opportunity of doing honour to themselves. A national monument that would have marked the era of this great improvement, and testified the gratitude of the nation to the author, would have been very creditable to the minister under whose patronage it was erected; and an acknowledgment from the navy that this discovery was the work of a landsman would have been highly becoming in a profession, of which intrepidity and valour are not more characteristic than frankness and generosity.

FROM THE MONTHLY REVIEW.

The Speeches of the Right Honourable Henry Grattan, in the Irish, and in the Imperial Parliament. Edited by his Son. 4 vols. 8vo. 2l. 8s. Boards. Longman & Co. 1822.

Who that cherishes or venerates the "*sanctus amor patriæ*," who that feels or does homage to great powers of eloquence exerted in the worthiest of causes, or who that has ever commiserated the sufferings of our sister-island, and has appreciated the efforts of her advocates and the glories of her ornaments, can fail to be interested in the name of GRATTAN, and thankful for the memorials of his career? They must

all applaud the diligence and the pious affection of his son, who has here collected and presented to them the speeches of his illustrious parent, accompanied by a short biographical memoir. Long, indeed, has this gentleman occupied a considerable space in the public attention; and his vast talents and unintermitted labours entitle him to a high rank among those whose lives have been honourable and beneficial to mankind. The recorded services of such men are the most unperishable monuments that can be raised to their honour by the gratitude of their survivors.

Henry Grattan was born in 1746 at Dublin, for which city his father was a representative. He was educated at that University, but in 1767 entered as a student of the Middle Temple; and, while prosecuting his studies there, he frequently attended the debates in the British parliament. He is said to have been peculiarly struck with the masculine vigour of Lord Chatham's eloquence; and those who amuse themselves with fanciful analogies have imagined a sort of affinity between the style and character of these great speakers. He certainly was, however, peculiarly studious of that shining orator; he frequently took down in writing entire speeches as they were pronounced; and there is now extant, in the hand writing of Mr. Grattan, a speech of this celebrated statesman which is not to be found in any printed collection. Among the contemporaries with whom Mr. G. set out in life, were Mr. Macaulay Boyd, (one of the supposed authors of Junius,) and Mr., afterward Judge Day; for the latter of whom he entertained an affection which grew with his years, and was extinguished only with his death.

In 1772, Mr. Grattan was called to the Irish bar; and he was then living in familiar intercourse with the many distinguished individuals who formed, the gay, the polished, and the intellectual circle of his native metropolis. Among these were Mr. Parker Bushe, Mr. Flood, Sir Hercules Langrishe, and Dr. Marlay, afterward Bishop of Waterford; and, in concert with Mr. Flood, he wrote several *jeux d'esprit* in ridicule of Lord Townsend's *bon vivant* administration, which were inserted in a collection called *Baratariana*. The friendship, however, which was nearest to his heart, the purest satisfaction of his life, and afterward the subject of its most tender and pleasing recollections, was that of the accomplished Lord Charlemont. It was at the house of this nobleman that the patriotic band who delivered Ireland were wont to assemble; and it was through his influence that, in 1775, Mr. Grattan was returned to parliament for the town of Charlemont. In 1790, he was elected for the city of Dublin: in 1800, he was chosen for Wicklow, to oppose the Union: in 1805, he came into the Imperial parliament for Malton; and in 1806 he was re-elected for his native city, and sat for that place in the several parliaments summoned in 1807, 1813, 1818, and 1820. On the accession of his present majesty, he came over to take his seat, contrary to the advice of his physicians and the remonstrances of his friends, his health being then in an alarming state. The project which filled his soul and animated its expiring efforts was the Catholic question: but he had tasked his strength beyond his powers of physical endurance. As he could not bear a journey by land, he went by water from Liverpool to London in a canal-barge, emptied of its lumber, and hung round with garden-mats. In this manner, for six days, he sat up in a chair without moving, sustained

by his anxiety to bear with his last breath his testimony to the holy cause of religious tolerance, and to perform his last duty to his country. After much suffering, however, he expired a few days subsequently to his arrival in London, on the 4th of June, 1820; thus finishing, by a species of political martyrdom, a patriotic and honourable course of public service.

His private life well corresponded with the purity of his public conduct; and an interesting simplicity was manifested in his character, not unlike that which was the charm and ornament of the domestic retirement of Mr. Fox. He loved to "forget the statesman in the friend." On the subjects that accidentally arise in social converse, philosophy, poetry, and politics, he was equally pleasing and instructive; every topic being illumined with the bright though softened rays of that powerful intellect, which was alike capable of elucidating the most perplexed and adorning the simplest matters on which it touched. When playful, he delighted the young; and when grave, even age itself was improved by his experience. His private conversations were replete with the purest morality, for he was never the momentary apologist of vice or profligacy. An instinctive innate horror of every thing low or corrupt, a religious devotion to public and private principle, from a rooted conviction that both were inseparably entwined together in their ethical relations, and a contempt for money, (the surest indication of a lively sensibility to the wants and sufferings of others,) were the chief outlines of his domestic character and habits. "His life," says his son, "was one continued, gentle, moral lesson. It was impossible in his society not to become enamoured of virtue."

Thus lived and thus died a man whom every age does not witness. Never was an individual exposed to the stormy elements of political strife, who experienced more of the proverbial levity of the people;—of that people whose political and moral depression he deplored, and devoted his whole life to ameliorate. He was the object of their fondest idolatry on one day;—in the next, rejected and despised. In 1798, he was denounced as the enemy to his country;—afterward, he was deified as the strenuous assertor of the constitution;—again he was traduced as the betrayer of the civil liberties of Ireland;—in 1812, he was elected by the unanimous voice of the people;—and in 1818 he was almost stoned to death in the midst of his native city.

For the honour of England, never insensible to native or to foreign worth, his death was universally mourned, and the sighs of the great and the good were mingled over his grave. Every individual, from the highest to the lowest, seemed to feel as if he had been deprived of a friend and a father; the interest of the sad solemnities was deepened by the unostentatious attendance at his funeral of all who were elevated in rank or ennobled by talent; and the warmest of his political opponents joined in the procession as if solicitous to bury in his tomb the passing animosities and contentions of the hour. The spot of earth dedicated to his mortal remains adjoined that which encloses the ashes of Pitt and of Fox. "*Atqui hæc sunt indicia solida et expressa; hæc signa probitatis, non fucata forensi specie, sed domesticis inusta notis veritatis.*" CICERO. Orat. pro Plancio.

Concerning the character of Mr. Grattan's eloquence, a greater variety of opinion may be fairly indulged, than the uniform and consenting feelings of mankind will suffer us to entertain of the manly

and undeviating rectitude of his public career. Though not liable to all the exceptions, which sound criticism and correct taste may justly make against that which is called the Irish school, his mode of speaking was far from being untinged by its faults. His best and most popular harangues may be said to be a string of antitheses; and he appeared more solicitous to produce effect by strong and pointed sentences, than by continuous and systematic reasoning. We certainly perceive, and to a great degree we feel, in this extraordinary orator, a style glowing, animated, and enthusiastic:—but at the same time we find it incongruous, and not formed according to the best taste; nearly all the members of the composition being equally laboured and expanded, without any due selection or subordination of parts. He is generally too epigrammatic, and his manner wants variety. There is an eloquence far beyond this sort;—the eloquence of reason, and of Fox:—which, conscious (as it were) of its native might, threw off when it started on its gigantic race all the trappings and ornament of a vulgar rhetoric, as incumbrances to its career. This was not the oratory of Grattan. He did not trust himself, like the Athenian, to the athletic and invincible strength of unadorned argument; but, infected with the prevailing taste of his countrymen, he could not resist the temptations which a figurative and metaphorical diction holds out to ardent and impassioned minds. We must add, also, the unconquerable love of point and antitheses, to which we have already made a passing allusion. It was this fault, which is hardly redeemed by a world of beauties, that imparted what may be called a mannerism to his mode of speaking that, on many occasions, counteracted the strength and impetuosity of his reasoning, and left the ear tired and sated with a ceaseless jingle of epigram and sentences. In early life, however, he was uninfected with this species of bad rhetoric; which grew on him towards the close of his career.

It is much to be lamented that scarcely a memorial exists of Mr. Grattan's first speeches, which are pre-eminently the best: but the true criterion of their excellence is manifest in the benefit which they were instrumental in effecting for Ireland. With respect to that country, it may be said of him as it was said of Augustus with respect to Rome, "*Latentiam invenit, marmoream reliquit.*" Ireland, before the time of Mr. Grattan, had scarcely a merchant, a manufacturer, or a name of note in literature:—the desert was planted by his hands. It is not easy, also, to imagine a more critical conjuncture than that in which he first appeared on the stormy theatre of Irish politics; which then exhibited, on one side, violence and power,—on the other, servitude and sedition;—a series of disgraceful alternations between exorbitant authority, sullen submission, secret repinings, and open rebellion.

Undoubtedly, no small part of these evils arose from the popery-laws;—the professed object of which was to reduce the Catholics to the condition of a miserable and despised race, without property and without education, and bound to the rest of the community by no ties of sympathy, no bond of common interest, no motives of affection. They divided the nation into two distinct bodies, one of which was to possess all the franchises, all the property, and all the education. Violence of conquest and tyranny of regulation, unintermitted for nearly a hundred years, had gradually reduced the people to a degraded mob, without estimation themselves, and holding in no estimation the

rank and influence of others. To palliate these disorders, Mr. Grattan, and a few who accorded with his views of policy, exerted themselves to raise an interest of property and education among them, and to hold out to them the animating expectation of participating in the benefits of a constitution, "which," as Mr. Burke somewhere observes, "is not made for great, general, and proscriptive exclusions."

Having entered on his career with the most ardent resolutions to restore the independence of Ireland, Mr. G. introduced his celebrated Declaration of Irish Rights, the first step towards the recovery of that legislative power of which the country had been deprived for centuries. His great speech on this occasion was delivered on the 9th of April, 1790, and it is said to have been electrical in its effect. That the subject of it may be better apprehended, we must be permitted to make a few preliminary observations.

The right of Ireland to make laws was first invaded by the 10th Henry VII. in a parliament held before the deputy, Sir Edward Poyning: which enacted that no parliament should set in Ireland without a certificate, under the great seal, of the acts that were to be passed; that they should be affirmed in England by the King in council; and that his license to summon a parliament must be obtained under the great seal of England. Thus the English Privy Council acquired the right of altering or suppressing acts of the Irish legislature, which consequently was deprived of the power to originate, alter, or amend. Ireland lost, moreover, her judicial rights. Against this usurpation, Molyneux protested in his celebrated "Case of Ireland," which was burned by the hands of the common hangman. The English House of Lords, however, persisted in reversing on appeal the decrees of the House of Lords in Ireland; and the disputes on this memorable subject at last gave rise to the declaratory act, 6 Geo. I., stating that Ireland was a subordinate and dependant kingdom; that the King, Lords, and Commons of England had power to make laws to bind Ireland; that the House of Lords of Ireland had no jurisdiction; and that all proceedings before that court were void. Although the Irish nation sullenly and reluctantly yielded, the spirit of the times began to awaken, and the arming of the volunteers gave weight and efficacy to their remonstrances. They had extorted a free trade from Great Britain; and many circumstances conspired to rouse them to a sense of their condition, and to an ardent aspiration after their rights. These circumstances are well introduced by Mr. Grattan:

"If this nation," said he, "after the death-wound given to her freedom, had fallen on her knees in anguish, and besought the Almighty to frame an occasion in which a weak and injured people might recover their rights, prayer could not have asked, nor God have furnished, a moment more opportune for the restoration of liberty, than this, in which I have the honour to address you.

"England now smarts under the lesson of the American war; the doctrine of Imperial legislature she feels to be pernicious; the revenues and monopolies annexed to it she has found to be untenable; she lost the power to enforce it; her enemies are a host, pouring upon her from all quarters of the earth; her armies are dispersed; the sea is not hers; she has no minister, no ally, no admiral, none in whom she long confides, and no general whom she has not disgraced; the balance of her fate is in the hands of Ireland; you are not only her last connexion, you are the only nation in Europe that is not her enemy. Besides, there does, of late, a certain damp and spurious supineness overcast her arms and councils, miraculous as that vigour which has lately inspired yours;—for with you every thing is the reverse; never was there a parliament in Ireland so possessed of the confidence of the people; you are the greatest political assembly now sitting in the world; you

are at the head of an immense army; nor do we only possess an unconquerable force, but a certain unquenchable public fire, which has touched all ranks of men like a visitation.

"Turn to the growth and spring of your country, and behold and admire it; where do you find a nation who, upon whatever concerns the rights of mankind, expresses herself with more truth or force, perspicuity or justice? not the set phrase of scholastic men, not the tame unreality of court-addresses, not the vulgar raving of a rabble, but the genuine speech of liberty, and the unsophisticated oratory of a free nation.

"See her military ardour, expressed not only in 40,000 men, conducted by instinct as they were raised by inspiration, but manifested in the zeal and promptitude of every young member of the growing community. Let corruption tremble; let the enemy, foreign or domestic, tremble; but let the friends of liberty rejoice at these means of safety and this hour of redemption. Yes; there does exist an enlightened sense of rights, a young appetite for freedom, a solid strength, and a rapid fire, which not only put a declaration of right within your power, but put it out of your power to decline one. Eighteen counties are at your bar; they stand there with the compact of Henry, with the charter of John, and with all the passions of the people. 'Our lives are at your service, but our liberties, we received them from God; we will not resign them to man.'"

The peroration of this exquisite piece of oratory is singularly powerful:

"There is no policy left for Great Britain but to cherish the remains of her empire, and do justice to a country who is determined to do justice to herself, certain that she gives nothing equal to what she received from us when we gave her Ireland.

"With regard to this country, England must resort to the free principles of government, and must forget that legislative power which she has exercised to do mischief to herself; she must go back to freedom, which, as it is the foundation of her constitution, so is it the main pillar of her empire; it is not merely the connexion of the crown, it is a constitutional annexation, an alliance of liberty, which is the true meaning and mystery of the sisterhood, and will make both countries one arm and one soul, replenishing from time to time, in their immortal connexion, the vital spirit of law and liberty from the lamp of each other's light; thus combined by the ties of common interest, equal trade and equal liberty, the constitution of both countries may become immortal, a new and milder empire may arise from the errors of the old, and the British nation assume once more her natural station—the head of mankind.

"That there are precedents against us I allow—acts of power I would call them, not precedents; and I answer the English pleading such precedents, as they answered their kings when they urged precedents against the liberty of England, such things are the weakness of the times; the tyranny of one side, the feebleness of the other, the law of neither; we will not be bound by them; or rather, in the words of the declaration of right, 'no doing judgment, proceeding, or any wise to the contrary, shall be brought into precedent or example.' Do not then tolerate a power—the power of the British parliament over this land, which has no foundation in utility or necessity, or empire, or the laws of England, or the laws of Ireland, or the laws of nature, or the laws of God,—do not suffer it to have a duration in your mind.

"Do not tolerate that power which blasted you for a century, that power which shattered your loom, banished your manufactures, dishonoured your peerage, and stopped the growth of your people; do not, I say, be bribed by an export of woollen, or an import of sugar, and permit that power which has thus withered the land to remain in your country and have existence in your pusillanimity.

"Do not suffer the arrogance of England to imagine a surviving hope in the fears of Ireland; do not send the people to their own resolves for liberty, passing by the tribunals of justice and the high court of parliament; neither imagine that, by any formation of apology, you can palliate such a commission to your hearts, still less to your children, who will sting you with their curses in your grave for having interposed between them and their Maker, robbing them of an immense occasion, and losing an opportunity which you did not create, and can never restore.

"Hereafter, when these things shall be history, your age of thralldom and poverty,

your sudden resurrection, commercial redress, and miraculous armament, shall the historian stop at liberty, and observe,—that here the principal men among us fell into mimic trances of gratitude,—they were awed by a weak ministry, and bribed by an empty treasury,—and when liberty was within their grasp, and the temple opened her folding doors, and the arms of the people clanged, and the zeal of the nation urged and encouraged them on, that they fell down, and were prostituted at the threshold.

“I might, as a constituent, come to your bar, and demand my liberty. I do call upon you, by the laws of the land and their violation, by the instruction of eighteen counties, by the arms, inspiration, and providence of the present moment, tell us the rule by which we shall go,—assert the law of Ireland,—declare the liberty of the land.

“I will not be answered by a public lie, in the shape of an amendment; neither, speaking for the subjects’ freedom, am I to hear of faction. I wish for nothing but to breathe, in this our island, in common with my fellow subjects, the air of liberty. I have no ambition, unless it be the ambition to break your chain, and contemplate your glory. I never will be satisfied so long as the meanest cottager in Ireland has a link of the British chain clanking to his rags: he may be naked, he shall not be in iron; and I do see the time is at hand, the spirit is gone forth, the declaration is planted; and though great men should apostatize, yet the cause will live; and though the public speaker should die, yet the immortal fire shall outlast the organ which conveyed it, and the breath of liberty, like the word of the holy man, will not die with the prophet but survive him.”

The great Irish patriots of that day had indeed undertaken an arduous enterprise. They did not however faint by the way-side, but proceeded with temper and with firmness. While Mr. Grattan was attacking the supremacy of the British parliament, Mr. Flood and Mr. Yelverton (afterward Lord Avonmore) attacked the law of Poynings; Mr. Gervase Bushe assailed the perpetual Mutiny Bill; and Mr. Gardiner and Sir Hercules Langrishe opposed the Penal Code. The plans of the political campaign were laid at Charlemont-House.

Ireland is chiefly indebted, however, to her Volunteers for the celebrated revolution of 1782, though various other causes had their share in it; such as the losses of Great Britain in America, and the irresolution, weakness, and subsequent dissolution of Lord North’s administration, which hastened it onwards. The Fox-party then came into power, and, as the first act of the new ministry, the Duke of Portland was sent to Ireland: when, by way of amendment to the address, Mr. Grattan moved a declaration of right, which was unanimously carried. The exordium of his speech on that occasion is so affectingly solemn, that we cannot abstain from extracting it. It is not, indeed, secure from criticism, for the characteristic habits of Mr. Grattan’s style frequently appear in it:—but who can stop to make petty exceptions to a rapid and impetuous eloquence, pronounced on one of the most awful and interesting subjects that can affect the dignity, the happiness, or the destiny of man?

“I am now to address a free people: ages have passed away, and this is the first moment in which you could be distinguished by that appellation.

“I have spoken on the subject of your liberty so often, that I have nothing to add, and have only to admire by what heaven-directed steps you have proceeded until the whole faculty of the nation is braced up to the act of her own deliverance.

“I found Ireland on her knees, I watched over her with an eternal solicitude; I have traced her progress from injuries to arms, and from arms to liberty. Spirit of Swift! spirit of Molyneux! your genius has prevailed! Ireland is now a nation! in that new character I hail her! and bowing to her august presence, I say, *Etsi perpetua!*

“She is no longer a wretched colony, returning thanks to her governor for his rapine, and to her king for his oppression; nor is she now a squabbling, fretful

sectary, perplexing her little wits, and firing her furious statutes with bigotry, sophistry, disabilities, and death, to transmit to posterity insignificance and war.

"Look to the rest of Europe, and contemplate yourself, and be satisfied. Holland lives on the memory of past achievements; Sweden has lost her liberty; England had sullied her great name by an attempt to enslave her colonies. You are the only people,—you, of the nations in Europe, are now the only people who excite admiration, and in your present conduct you not only exceed the present generation, but you equal the past. I am not afraid to turn back and look antiquity in the face: the Revolution,—that great event, whether you call it ancient or modern I know not, was tarnished with bigotry; the great deliverer (for such I must ever call the Prince of Nassau,) was blemished with oppression: he assented to, he was forced to assent to acts which deprived the Catholics of religious, and all the Irish of civil and commercial rights, though the Irish were the only subjects in these islands who had fought in his defence. But you have sought liberty on her own principle: see the Presbyterians of Bangor petition for the freedom of the Catholics of Munster. You, with difficulties innumerable, with dangers not a few, have done what your ancestors wished, but could not accomplish; and what your posterity may preserve, but will never equal: you have moulded the jarring elements of your country into a nation, and have rivalled those great and ancient commonwealths, whom you were taught to admire, and among whom you are now to be recorded: in this proceeding you had not the advantages which were common to other great countries; no monuments, no trophies, none of those outward and visible signs of greatness, such as inspire mankind and connect the ambition of the age which is coming on with the example of that going off, and forms the descent and concatenation of glory: no; you have not had any great act recorded among all your misfortunes, nor have you one public tomb to assemble the crowd, and speak to the living the language of integrity and freedom.

"Your historians did not supply the want of monuments; on the contrary, these narrators of your misfortunes, who should have felt for your wrongs, and have punished your oppressors with oppression's natural scourges, the moral indignation of history, compromised with public villany and trembled; they excited your violence, they suppressed your provocation, and wrote in the chain which entrammelled their country. I am come to break that chain, and I congratulate my country, who, without any of the advantages I speak of, going forth as it were with nothing but a stone and a sling, and what oppression could not take away, the favour of Heaven, accomplished her own redemption, and left you nothing to add and every thing to admire."

We could have wished that no memorial existed of the memorable dispute between Mr. Grattan and Mr. Flood, on the subject of the Repeal of the Declaratory Act. The controversy was, in fact, merely verbal: but the invective of Mr. Grattan, though not unprovoked, was unmeasured in satire, poignancy, and bitterness. The disputants were in after-life reconciled; and it is to be lamented that even a transient cloud lowered over two eminent men, engaged in the sacred cause of their country's deliverance.

It is by his exertions in behalf of the Irish Catholics, that Mr. Grattan has formed the most lasting monument of his greatness. Never was perseverance in effecting a great object of policy and justice more steadily, and, we may add, more beautifully exhibited. The great law of Christian tolerance and religious charity seemed the inexorable rule of Mr. Grattan's political life:—but it is disgraceful to an age abounding in the mature fruits of literature and philosophy, to state that, down to 1782, the Catholics had no rights of property and education. The bill which enabled them to acquire lands by purchase, grant, descent, devise, &c., restored them to the free exercise of their religion, secured them from the confiscation of their houses and property, and removed their disabilities as to education, was first carried (without a division) in that year.

Thus slowly do the vain prejudices of man fade before the increasing

lights of reason and humanity!—but the progress of better opinions, though tardy and impeded, is at length mighty and irresistible. In the present state of enlightened feeling, it will be difficult to believe (what is strictly true) that, when the Catholic question was first introduced into the Irish House, Mr. Grattan and Mr. Dennis Browne, who supported it, could scarcely obtain a hearing. The petition of the Catholic body was even ignominiously rejected; and it is said that Sir Henry Harstonge actually carried it down to the bar, and kicked it out of the House. These difficulties, however, were as resting places only to the victorious progress of Mr. Grattan's exertions. It was his uniform opinion,—almost a part of the constitutional frame of his mind,—that the fate of Ireland as an independent nation hung on that decision; and that the constitution could not be upheld unless all classes and ranks were interested in its conservation.—His labours were not consecrated only by the justice of his cause:—he *succeeded* in his pious struggle for the rights of religion and humanity. Concessions to the Catholics went *pari passu* with the free trade and independence of the country; and never was political prophecy so literally verified as his celebrated exclamation, frequently remembered since it was uttered,—"The day you reject the Catholic question, that day you vote the Union."

In the Imperial parliament, he repeatedly introduced that question, and on one occasion nearly triumphed in carrying it. He spoke also on other topics of moment:—the Orders in Council; the Walcheren expedition; Irish tithes; the Irish Convention-act; and the war with Bonaparte in 1815; and at these times he was heard with the most respectful attention. Indeed, his venerable age, his long life consecrated to the advantage and happiness of his country, and the eminence which he had so early acquired and so long retained, could not but secure to him from the urbanity of the first assembly in the world a silent and patient audience:—but the peculiar character of his eloquence suffered much in being transplanted from its kindred soil, where it had been nurtured by local associations which now had no existence. Its habitual warmth, its tone of high moral indignation and virtuous contempt, which struck so forcibly on the chords of national sympathy, when he hurled his invectives against those venal and corrupt parasites of the Castle by whom Ireland was blighted as by locusts, had no longer the same exciting causes to call them into play. Of a settled country, secure in its recognised privileges, and having rather to defend those privileges than to struggle for their acquisition, the popular eloquence is principally of a sedate and more subdued description; and principles being too thoroughly established to be called into doubt, or exposed to jeopardy, the usual controversies turn on questions which chiefly require accuracy of detail and justness of reasoning. Hence it was that, in the English House of Commons, the strong and vehement though frequently disjointed and abrupt sententiousness of Mr. Grattan had little effect, beyond that of rareness and singularity.

It is remarkable that Mr. Grattan was at variance with many of the Whig-party in parliament, on the question of a war with Bonaparte after the violation of the treaty of Elba; and it is also to be observed that one of the most powerful orators of modern times, his friend and countryman, Mr. Plunket, was fighting by his side on that important oc-

casion. Having stated the real question to be whether we should go to war when our allies were assembled, or when they should be dispersed, Mr. Grattan thus proceeded in his speech:

"Sir, the French government is war; it is a straticracy, elective, aggressive, and predatory; her armies live to fight, and fight to live; their constitution is essentially war, and the object of that war, the conquest of Europe. What such a person as Bonaparte at the head of such a constitution will do, you may judge by what he has done; and, first, he took possession of the greater part of Europe; he made his son King of Rome; he made his son-in-law Viceroy of Italy; he made his brother King of Holland; he made his brother-in-law King of Naples; he imprisoned the King of Spain; he banished the Regent of Portugal, and formed his plan to take possession of the crown of England; England had checked his designs; her trident had stirred up his empire from its foundation; he complained of her tyranny at sea; but it was her power at sea which arrested his tyranny at land; the navy of England saved Europe. Knowing this, he knew the conquest of England became necessary for the accomplishment of the conquest of Europe, and the destruction of her marine necessary for the conquest of England. Accordingly, besides raising an army of 60,000 men for the invasion of England, he applied himself to the destruction of her commerce, the foundation of her naval power. In pursuit of this object, and on his plan of a western empire, he conceived, and in part executed, the design of consigning to plunder and destruction the vast regions of Russia; he quits the genial clime of the temperate zone; he bursts through the narrow limits of an immense empire; he abandons comfort and security, and he hurries to the pole, to hazard them all, and with them the companions of his victories, and the fame and fruits of his crimes and his talents, on a speculation of leaving in Europe, throughout the whole of its extent, no one free or independent nation: to oppose this huge conception of mischief and despotism, the great potentate of the north from his gloomy recesses advances to defend, against the voracity of ambition, the sterility of his empire. Ambition is omnivorous, it feasts on famine and sheds tons of blood, that it may starve in ice, in order to commit a robbery on desolation. The power of the north, I say, joins another prince, whom Bonaparte had deprived of almost the whole of his authority, the King of Prussia; and then another potentate, whom Bonaparte had deprived of a principal part of his dominions, the Emperor of Austria. These three powers, physical causes, final justice, the influence of your victories in Spain and Portugal, and the spirit given to Europe by the achievements and renown of your great commander,* together with the precipitation of his own ambition, combine to accomplish his destruction. Bonaparte is conquered; he who said, 'I will be like the Most High;' he who smote the nations with a continual stroke; this short-lived son of the morning, Lucifer, falls, and the earth is at rest; the phantom of royalty passes on to nothing, and the three kings to the gates of Paris; there they stand, the late victims of his ambition, and now the disposers of his destiny, and the masters of his empire; without provocation he had gone to their countries with fire and sword; with the greatest provocation they come to his country with life and liberty; they do an act unparalleled in the annals of history, such as nor envy, nor time, nor malice, nor prejudice, nor ingratitude can efface; they give to his subjects liberty, and to himself life and royalty. This is greater than conquest! The present race must confess their virtues, and ages to come must crown their monuments, and place them above heroes and kings in glory everlasting.

"When Bonaparte states that the conditions of the treaty of Fontainebleau are not performed, he forgets one of them, namely, the condition by which he lives. It is very true there was a mixture of policy and prudence in this measure; but it was a great act of magnanimity notwithstanding, and it is not in Providence to turn such an act to your disadvantage. With respect to the other act, the mercy shown to his people, I have underrated it: the allies did not give liberty to France, they enabled her to give a constitution to herself, a better constitution than that which, with much laboriousness, and circumspection, and deliberation, and procrastination, the philosopher fabricated, when the Jacobins trampled down the flimsy work, murdered the vain philosophers, drove out the crazy reformers, and remained masters of the field in the triumph of superior anarchy and confusion; better than that, I say, which the Jacobin destroyed, better than that which he afterwards formed,

* * The Duke of Wellington."

with some method in his madness, and more madness in his method; with such a horror of power, that in his plan of a constitution, he left out a government, and with so many wheels, that every thing was in movement, and nothing in concert, so that the machine took fire from its own velocity; in the midst of death and mirth, with images emblematic of the public disorder, goddesses of reason turned fool, and of liberty turned fury: at length the French found their advantages in adopting the sober and unaffected security of King, Lords, and Commons, on the idea of that form of government which your ancestors procured by their firmness, and maintained by their discretion. The people had attempted to give the French liberty, and failed; the wise men (so her philosophers called themselves) had attempted to give liberty to France, and had failed; it remained for the extraordinary destiny of the French, to receive their free constitution from kings. This constitution, Bonaparte has destroyed, together with the treaty of Fontainebleau, and having broken both, desires your confidence; Russia confided, and was deceived; Austria confided, and was deceived. Have we forgotten the treaty of Luneville, and his abominable conduct to the Swiss? Spain and other nations of Europe confided, and all were deceived. During the whole of this time, he was charging on England the continuation of the war, while he was, with uniform and universal perfidy, breaking his own treaties of peace, for the purpose of renewing the war, to end it in what was worse than war itself,—his conquest of Europe."

We have quoted this passage because it exhibits in a limited compass the excellences and defects of Mr. Grattan's oratory. In contradiction to the ordinary progress by which the fire of imagination becomes cool with advancing years, it should seem from this specimen that he allowed it a more unbridled career as he drew nearer to the verge of his political and his natural existence. The aberrations of the human intellect naturally resemble each other; and when we were reading, in the speech of which we have just extracted a part, "of heaven and earth being set adrift from one another," and, "making God Almighty a tolerated alien in his own creation," we were forcibly reminded, by the extravagant mysticism of the passage, of one of the flights of the Della Crusca school of poetry, where the poet makes

— "the Creator blush to see
How horrible his works can be."

We now close this article; which we have conscientiously lengthened, from a conviction that even our frail and perishable pages ought to assist in upholding the just fame of a great and good man. Such persons, who are equally the ornaments of public and private life, ought not to be penuriously praised. To Mr. Grattan, making due allowance for the imperfections of our common nature, we sincerely believe that the words of one of the most philosophical poets of antiquity may be strictly applied, and we know not whether human panegyric can go beyond them:

"*Compositum jussu suaque animi, sanctosque recessus
Mentis et incostum generoso pectus honesto.*"

FROM THE RETROSPECTIVE REVIEW.

The Life of the Honourable Sir Dudley North, Knt. Commissioner of the Customs, and afterwards of the Treasury, to his Majesty Charles the Second; and of the Honourable and Reverend Dr. John North, Master of Trinity College in Cambridge, and Greek Professor, Prebend of Westminster, and some time Clerk of the Closet to the same King Charles the Second. By the Honourable Roger North, Esq. 4to. London, 1744.

“Ea complectitur, quibus ipse interfuit.”—*Cic. de Leg. lib. 1.*

THIS pair of family portraits is by the same hand, and in the same style, as the life of Lord Keeper Guilford, of which curious and entertaining book, an account was given in one of our earlier numbers. There are here the same bold but coarse strokes of description, the same easy and familiar handling of the subject, the same lavishness of homely yet often forcible language, the same simplicity, narrowness, honesty and prejudice, which distinguished the work to which we have alluded.

This work has its peculiar merits—to say nothing of the amiable spectacle which is presented to us of the youngest of four brothers remaining firmly and tenderly attached to each and all through life, and after their death, spending the last years of his retirement from the world in recording their virtues and describing their actions. Of the six sons of Dudley Lord North, the eldest succeeded to the title, and to far the greater part of no very large estate. He appears always to have kept aloof from his brethren, who were left to struggle through the world, and rise to eminence by the force of their own attainments. The second son, Francis, afterwards Lord Keeper Guilford, led the way; in him the others seem always to have found a steady, able, and affectionate friend, assistant, and adviser. For these reasons, and perhaps from the superiority of his talents, he is always styled through these memoirs their *best* brother. The third son, Dudley, sought his fortunes abroad as a merchant. The fourth son went to Cambridge, and rose in the Church. The fifth son, Montagu, was also a Levant merchant, and in partnership with Dudley, and died abroad. The sixth and last was Roger, who succeeded in the law, was the faithful friend and companion of his brothers, and wrote the lives of them all. We have said *all*, for Montagu North appears to have had little to distinguish him, and though no separate memoir is written concerning him, that little is mentioned in different parts of the lives of his brothers.

The lives of Sir Dudley North and Dr. John North, here published together, form a most remarkable contrast. The first was an active, shrewd, bold and enterprising merchant, who early left his native soil, and only returned to it after various travels and persevering exertions in different countries; the latter, a sedentary, nervous, and timid scholar, of profound learning, who scarcely ever left the University except for a visit to the metropolis, or an excursion into Suffolk. Sir Dudley scarcely ever looked at a book, save waste, journal, and ledger; but was full of knowledge and information, which he gained by actual experience. The Doctor was an enthusiastic lover of a library, to form which was the busiest scene of his still and silent life. He was not, however, only a collector of books, but was extensively and thoroughly acquaint-

ed with their contents, being a complete master of all the ancient languages; while his brother, entirely ignorant of these, appears to have known every dialect and even jargon of Europe, which could be useful to an extensive trader. In one thing alone, they seem to have coincided; they both, by opposite paths, rose to wealth and eminence, and died in their several ways, respected and distinguished.

Of the merchant, first, Dudley North was born in the year 1641, and after passing through the sicknesses and accidents of childhood, which are here duly noted, he was placed under the rigid rule of a schoolmaster at Bury, where he appears to have attended rather to the arts of trafficking and cheating his schoolfellows, than to those of literature. Displaying, thus early, a genius for trade, and by his inattention to study procuring the aversion of his master, he was removed to a writing-school in London, in order to be prepared for entering a merchant's counting-house. Here, in a great measure left to himself, he made a full use of the liberty of the metropolis, and chose the companions and amusements suited to his humour. In these scenes, his future character was formed. His enterprising spirit showed itself in petty excursions, and in frolics and rambles about the town, while he extricated himself from embarrassments by the force of his ingenuity. "If," says his brother, "if, together with his restless spirit, he had not conjoined a manly reflection, reserved within himself, and also a resolution of sometimes checking his own extravagances, (which not only in his youth, but also in many important emergencies in his life, he executed by *making short and sudden turns*;) he had been lost." It is such observations as these which make biography more particularly useful, and which are usually only to be found recorded by the individual himself who has applied them. In a course of vice or folly, it is far easier to turn short and leave the path altogether, than to adhere to resolutions of gradually slackening the pace, or slowly and silently changing the road. Dudley had got into debt beyond his means of payment; but contriving to extricate himself, certainly by no very honourable means, he, from that time forward, determined never to procure a single item, however small, upon credit; and to that resolution firmly adhered, which, in the opinion of his brother, saved him. Judging, indeed, from the account given of his habits and companions, he seems to have fallen into bad hands, and one cannot but be struck by the want of refinement which appears to characterize the manners of this young nobleman, which, as a brother relates them without remark, we may conclude, were not thought at the time unworthy his station. Of his attachment to swimming, for instance, he gives the following account, which is, moreover, in itself amusing:

"Another of his darling sports was swimming in the Thames. He used that so much, that he became quite a master of it. He could live in the water an afternoon, with as much ease as others walk upon land. He shot the bridge diverse times at low water, which showed him not only active but intrepid; for courage is required to bear the very sight of that tremendous cascade, which few can endure to pass in a boat. He told me, that his method was to glide along while the current was smooth, which was like the motion of an arrow, and extremely delicious; and when he was through, and plunged in the disorders of the waters, there he used his swimming powers, that is, striking with legs and arms, applying all the force he had to prevent turning round, which in those eddies was hard to be done; and all this under water, till he got into some calm where he might govern himself again. His greatest danger was flocks of anchors, broken piles, great stones, and such

enemies as lay concealed under water, and, in the speed he went, could not be touched without destruction.

"He and his comrades usually hired a known porter to keep their clothes, and when they were all naked, as I have often heard him say, he was not at all ashamed of his company, but when *their clothes were on*, he cared not to be seen with them."

From the writing-school, he was removed to the house of a Turkey merchant of no great business, who, during his apprenticeship, sent him out as a supercargo to Archangel, and thence to Italy and Smyrna, at which place he was at last settled as a factor for his master. For the time occupied in this voyage, the narrative is filled up by the letters of the young merchant to his "best" brother, which are exceedingly creditable to his talents and acquirements. They give so lively and entertaining a description of the scenes in which he was moving, and the manners he was observing, that we shall be tempted to make an extract from this part of the book, and we wish we could make more. He thus observes, upon the character of seamen, and their occupation :

"I think the seaman's life fit for none but such dull souls as think themselves happy in keeping a place warm, as wide, though seldom so long, as a coffin—and this for one four hours, which they call a watch ; and when that task is over, are as happy in the enjoying a walk a little larger than the aforesaid lodging, where their turnings are so quick, that it would puzzle one to imagine what they are doing. No time is so pleasant to me as when the wind blows fresh, and I see twenty-four or twenty-five men stand cursing themselves and damning others, just as if the devil himself and his comrades were come to show tricks. Then I get me to a corner, where I am sure to be out of the way, and sit me down, pleased with observing, till a new and contrary motion of the vessel raiseth a tempest in myself, &c.

I envy the condition of those that have store of employment, and are so far from devising ways to pass time, that the days are not sufficient for the business. But as soon as I get me ashore, I hope to have my wish in that, for I do not fear want of employment, and have taken up a resolution not to be idle as long as I can find any thing in the world to do. I had thought to employ myself aboard by keeping an account of the ship's way, but am disappointed, for the master and mates, on whom that charge lies, are a sort of people who do all by mechanic rule, and understand nothing, or very little, of the nature and reason of the instruments they use. And where that little happens, they are very shy of it, and if at any time one speaks to them, they think they have a blockhead to deal with who understands nothing, and they will bear no objections to their dictates. As for reasons and causes, they lie beyond their capacity. All that's not set down at large in their books, they account no better than damnable doctrine and heresy. Their quotations are irrefragable, and not to be disputed."

There is a very good account of the people of Archangel ; and the supercargo, who appears to have never allowed any thing to escape him, describes the manner of making tar, their steam-baths, &c. in a very satisfactory manner. Sailing between Ireland and the Height of the Cape, towards the Mediterranean, they were overtaken by a storm, of which he gives a striking relation. Leghorn, Pisa, Florence, are all described in their turn, in a manner which plainly shows the activity and inquisitiveness of the traveller's mind. His conduct at Smyrna was exemplary, and we cannot help referring all who wish to thrive by perseverance, industry, and dexterity, and to gain the good will of their rivals by a frank and cheerful demeanour, to the book itself. In all the arts of prudence, Mr. Dudley North was born a master, and yet he does not appear to have descended to servility, or to have impaired the integrity of his honour. This part of the work, and indeed many

others, cannot fail of proving beneficial to the mercantile youth, who have as yet their course to carve. And the more so, because such opportunities of deriving assistance from books are exceedingly rare. The life of a merchant is not commonly a tempting subject to the biographer, and consequently very few such works have been written. It is not, however, here that we can supply the place of the book itself; no extracts can display the ever-watchful activity,—the cautious yet enterprising spirit of speculation,—the promptness to seize an offered opportunity, joined with the utmost accuracy and industry in recording his mercantile transactions, and in preserving his accounts clear and correct,—which marked the whole life of this distinguished merchant. From Smyrna he was invited to Constantinople, as a partner of a considerable house, long established there, in which, first as a junior partner, and afterwards as chief, he spent the remainder of his time in the east. Here again he applied all those useful qualifications which he had found so valuable at Smyrna. The accounts of the house were perplexed and entangled, but he had such a faculty of restoring order in involved transactions, as almost amounted to genius. Regularity was restored, and then he turned his active mind to mastering the character and manners of the Turks, which he did to such a degree, that perhaps no other Infidel was ever treated by them with so much confidence. Of his intimate knowledge of Turkish law, as well as of their habits and customs, arts and attainments, he has left behind him a convincing proof, in the mass of valuable information on all these subjects, as recorded by his brother, in this book, partly copied from the merchant's papers, and partly communicated orally to his friends. Of this department we can afford to give no specimen; but to show the extensiveness of his fame in Constantinople, which had even made an impression on the incurious Turk, and reached the recesses of the seraglio itself, we may quote the following short passage:—

"The great officers about the Grand Signor, with whom he had transacted and (with such respect as became him) familiarly conversed, told his majesty that there was now, in the city of Constantinople, an extraordinary Gower, as well for person as abilities to transact the greatest affairs; and, so in the ordinary conversation with the Grand Signor, he was often named for somewhat considerable besides his acting as hasnader of the English nation under their ambassador. The Grand Signor declared he would see this extraordinary Gower, and accordingly the merchant was told of it, and at the time appointed, an officer conducted him into the seraglio, and carried him about till he came to a little garden, and there two other men took him by the two arms, and led him to a place where he saw the Grand Signor sitting against a large window, open in a chamber not very high from the ground. The men that were his conductors holding each an arm, put their hands upon his neck, and bowed him down till his forehead touched the ground; and this was done more than once, and is the very same forced obeisance of ambassadors at their audiences. After this he stood bolt upright as long as the Grand Signor thought fit to look at him, and then upon a sign given, he was taken away, and set free again by himself, to reflect on this his romantic audience."

After residing twenty years in the Levant, our merchant returned home to enjoy the fruits of his industry; but, before we say any thing of his English career, we will transcribe a few of the anecdotes with which the biographer closes this part of the life. His brother used to give the following amusing account of the Jews in Constantinople, who were employed as brokers.

"When a fresh merchant or factor comes to Constantinople, the first Jew that catches a word with him marks him for his own, as becoming his peculiar proper-

ty, and calls him his merchant, and so he must be as long as he stays. And from this time no other Jew will interpose to deprive him of his purchase, but as soon rob a house as do it. And thus by compact, or custom, among themselves, the sacred rule of right is established. On the other side, the merchant can no more shake off his Jew than his skin, he sticks like a bur, and whether well used or ill used, will be at every turn in with him, and no remedy,—somewhat the rogue will get out of him, in spite of his teeth, and commonly (besides play) just so much more as he is trusted with. And the merchant cannot be without a Jew, nor change that he hath. The only expedient is to make the best of him, and never trust him upon honour. It is not a little convenience that is had by these appropriated Jews, for they serve in the quality of universal brokers, as well for small as great things. Their trade is running up and down, and through the city, like so many of Job's devils, perpetually busking after one thing or other, according as they are employed. If the merchant wants any thing, be it ever so inconsiderable, let him tell his Jew of it, and if it be above ground, he will find it. This is accounted a common advantage, for there are multitudes of people that have need of each other, and want means to come together, which office the Jews perform admirably. And in like manner they apply to the great men at court, calling themselves his merchant, at whose house or gate they wait expecting employment. For when any thing is wanted, the Jew is spoke to, and he, with wonderful despatch, procures it. And they have great profit by these trusts, which they account as the vails of their places."

The superstition and ignorance of the Turks is well illustrated (if illustration were wanted) by this and the succeeding extracts.

"The Turks are the most superstitious of all people, and have an opinion of fascination by ill eyes, and the merchant had once like to have suffered on that account,—for being at the sports mentioned in his letter to the Italian, he observed a rope-dancer come down from a tower, and thought by minute watch to know in how many seconds he passed to his place; and as he stood counting three, four, five, &c. the rope broke. This disappointment troubled the Turks that stood thick gaping up, and some wondering how such an accident should happen. One said, he believed that fellow was the cause of it, for he saw him hold somewhat in his hand, and mutter over it. The merchant hearing this, crept away as fast as he could; for if the mob had fallen upon him for an enchanter, he had passed his time but very indifferently amongst them."

And again:

"But all these different professors of religion have a firm faith in what they call *reading over*; and they use it promiscuously. For if a common Turk hath a horse sick, he will have the *Alcoran* read over it, and rather than fail, the law of Moses, or the gospel of Christ. And there are poor Christians that will get an holy man, though a Turk, to read over a sick child, and the poor Jews the like. It is the *reading over* that they value, together with the venerable phiz of the holy man, that performs without much distinction what it is he reads."

Again, in their belief of a life in the grave:—

"The Turks have an opinion, that men that are buried have a sort of life in their graves. If any man makes affidavit before a judge that he heard a noise in a man's grave, he is by order dug up and chopt all to pieces. The merchants once airing on horseback, had (as usual for protection) a janizary with them. Passing by the burying-place of the Jews, it happened that an old Jew sat by the sepulchre. The Janizary rode up to him, and rated him for stinking the world a second time, and commanded him to get into his grave again."

When Mr. North returned to England, he had been too long engaged in scenes of active exertion to remain at home without employment. Accordingly, he soon engaged himself in extensive mercantile transactions, and by his commissions supported the house he had left behind him in the east. He also early became a principal member in the Levant company, and took a chief part in managing its concerns. His name became celebrated, and in very turbulent times, at a crisis

when the shrievalty of the city was a service of danger, he accepted the office, at the personal request of the king, Charles the Second, made to his brother, who was then Lord Chief Justice. Mr. North's general ability, and his peculiar talents for business, and skill in the management of intricate accounts, together with the influence of Lord Guildford, so on recommended him to a principal place in the customs, and thus extended his sphere of usefulness. Two or three circumstances, which came under the actual inspection of the king, conspired to give him so high an opinion of Sir Dudley North's talents, that he removed him into the treasury. When James II. ascended the throne, Sir Dudley came into parliament, where he took a principal part in debates, concerning the revenue, until the dissolution. At the revolution, he was left out of the commission of the customs, to which place he had previously returned from the treasury, and then retired into private life, in which he died, in London, in the year 1691.

In the course of the narrative, which describes the period of his life, from his return to England to his death, we have various anecdotes, which display his character in a remarkable point of view, and also scattered notices, which let in a light upon this eventful stage of English history; of these, we can afford to extract only a very few.

Our merchant returned to England at the point when the credit of the famous Titus Oates and his confederates began to decline. But so extensively had his fame been spread, that we are told, his name was idolized among the loyal merchants of Constantinople, where, in all their jollities, they celebrated his health immediately after that of the king. When Mr. North returned, the method of keeping accounts at bankers' houses was commencing, and the goldsmiths just in the act of metamorphosis from their proper trade to that of banker. This seemed a novel and pernicious scheme to our trader; but after long resistance, he was obliged to yield to the prevailing fashion, and it is recorded, first "used the shop of Sir Francis Child, at Temple Bar, for the paying and receiving all his great sums." Such is the antiquity of this ancient house. When the Prince of Orange landed, the loyalists were, of course, in great alarm, especially those who had in any way, like Sir Dudley North, rendered their attachment to the Stuarts remarkable. All such were flying from the metropolis in every direction; but Sir Dudley, relying, as was his wont, on the integrity of his actions, and the goodness of his motives, with his usual boldness, refused to stir.

"At this time, Sir Dudley North and myself were seldom asunder, but walked about from one bustle to another, to observe what was doing, and were in all public places to see how matters wrought. For he, according to his true character, so long as he could justify his actions, feared nothing, and scarce thought he had any concern in the turn more than any other men had. This was a foul disappointment to his enemies; for they made a sure account that he, a ringleader of the Tory party, must needs run away, and then they had him fast, in prison at least. Once we walked together into the Exchange; and one that stood in a company said, What! is not he gone yet? We passed on, and took no notice. He was looked at almost as much as when he was named sheriff; and the wonder that he was not gone, was as great as when he was to be sheriff. And it was in his good stars, that he secured himself a safety, by staring his enemies in the face."

He had little to fear. Though, when the important concerns of

government were settled, he was examined before a committee of the House of Lords, and also before the House of Commons, respecting his taking upon him the shrievalty. Of this examination, an amusing account is given—the following is part of it:

"But there being some cessation, Mr. Dutton Colt made silence by speaking. 'Mr. Foley,' said he, 'since this gentleman is so tender that he must not be asked questions concerning himself, we will let that go and presume him guilty of all that has been alleged against him. But I hope I may ask him a question concerning somebody else.' At this, Sir Dudley North, knowing the man, and expecting he would have named his brother, the Lord Keeper, began to warm and his blood to mend its pace. And had that been perceived, any one, that knew him, would have expected something extraordinary to follow. Then, Mr. Colt went on; 'and I ask him,' said he, 'if Secretary Jenkins did not come down to the city, and persuade him to take the office of sheriff upon him.' 'You hear the question,' said the chairman. After which there was a profound silence, expecting the answer. All which time, Sir Dudley North was gathering as much breath as he could muster, and then out came a long No-o-o-o, so loud, as might have been heard up to the House of Lords. This was so violent and unexpected, that I could see a start of every one in the house all at the same instant, as if each had had a dash of cold water in his face. And immediately all called out, 'Withdraw;' and my neighbour, Titus Oates, being, I suppose, frustrated of his expectations, cried out, 'Aw Laard, Aw Laard, Aw, Aw,' and went his way. Sir Dudley North went out, and never was called upon more about this affair."

It is, however, time to turn to the life of the Doctor, which, though much less busy, is to us much more interesting.—The Hon. John North was born at London in 1645. His reserved and studious temper, even in childhood, early marked him for the church. "If any thing," says his brother, "seemed amiss in him, it was a non-natural gravity, which, in youths, is seldom a good sign; for it argues imbecility of body and mind, or both; but his lay wholly in the former, for his mental capacity was vigorous, as none more." At the proper age, he was sent to Bury, where he was placed under Dr. Stephens, then master of an eminent school there. This was in the time of the Commonwealth, the period which the biographer designates as "the dregs of time." Of this Dr. Stephens, a character is given, which affords a lively idea of a cavalier pedagogue, obliged to submit to the puritanical regulations of the time.

"The master was pedant enough, and noted for high flights of poetry and criticism, and what we now call jingling, not a little derived from the last age, all which qualities were not amiss in his employment. The worst of him was what his corpulence declared, and being a wet epicure, the common vice of bookish professions.

One happiness was, that he was a noted Cavalier, then the title of the king's friends in opposition to the rebels, who, from a precise cut they affected, were styled Roundheads. In the worst of those times, the master, in his family, used the forms of loyalty and orthodoxy, but being reputed little better than a *malignant*, he was forced to use outwardly an occasional conformity, by observing the church duties, and days of super-hypocritical fastings and seekings, wherewith the people, in those days, were tormented; though now worn out of almost all credibility; and he walked to church after his brigade of boys, there to endure the inflictions of divers holders forth, tiring themselves and every body else. And by these means, he made a shift to hold his school."

In the year 1661, Mr. North was sent to Cambridge, where he was entered a fellow-commoner, and afterwards a nobleman, of Jesus College. Here commenced that severe course of study and constant habit of thought, which, together with a tendency to inaction, ended

in bringing upon him a premature old age, and, in the mean time, encouraged that timidity of disposition, and that irritability of the nervous system, which rendered the latter part of his life a prey to gloomy whims and melancholy forebodings.

"The doctor's greatest, or rather only infirmity, was a natural timidity, owing to a feeble constitution of body, inclining to the effeminate. This, under some circumstances, and without a mind as vigorous and strong as his body was weak, might have oppressed him. He was always sensible of this weakness, and, during the whole course of his life, laboured to conquer it, and, as to outward appearance, prevailed; and what was insuperable lay dormant in himself. One would have expected that a youth at the university, no freshman, nor mean scholar, should have got the better of being afraid in the dark; but it was not so with him; for when he was in bed alone, he durst not trust his countenance above the clothes. For some time he lay with his tutor; who, once coming home, found the scholar in bed with only his crown visible. The tutor, indiscreetly enough, pulled him by the hair; whereupon he sunk down, and the tutor followed, and at last, with a great outcry, the scholar sprung up, expecting to see an enormous spectre. Another time, which was after he was Fellow of the College, in a moon-shine night, he saw one standing in a white sheet. He surveyed it with all his optics, and was confirmed it was a spirit, (as they call it,) and resolved with himself, if he could, to find out what it came for. He got out of his bed, and, being still of the same opinion, went nearer and nearer, till he might touch it; and then, reaching out his hand, he perceived it was only his towel hung against the wall, with the moon shining full upon it, and then he went to bed and slept well."

While an under-graduate, he maintained a high character for learning and conduct: the simple and honourable nature of his feelings; his few wants; his intense application, and contented, cheerful, and affectionate disposition, in this his first outset in life; are well described in some of the passages which we shall select: as, for instance,

"He had in his nature a principle of justice and duty inexpugnable; and was fortified with a resolution not to run in debt, nor to help himself by any wicked compliances, whatever otherwise became of him. And while he was at the college, he just shifted, with a small exhibition from his family; and if it had been less, (according to his strict economy,) he had still shifted; and more he did not expect, knowing that the hereditary honour must devour the fat of the land. And as to future preferments, nothing more uncertain. All his hopes hung upon mutable interests, and he found in himself little inclination to courtship and flatteries for favours. His sheet-anchor was the life of his life, a dear brother and friend who might drop from him. He had an ambition to be master of a good library, but scarce hoped ever to obtain it; and when he became able to make a small purchase of books, he was so far happy, and, in himself, pleased that his management succeeded so well, which created in him a sort of joy in a perseverance, even after the just cause, by his being better provided for ceased."

In 1666, he was admitted a fellow of his college, and began to indulge himself in the warmest passion which animated him, the purchasing of books.

"He courted, as a fond lover, all best editions, fairest characters, best bound and preserved. If the subject was in his favour, (as the classics,) he cared not how many of them he had, even of the same edition, if he thought it amongst the best, either better bound, squarer cut, neater covers, or some such qualification caught him. He delighted in the small editions of the classics by Seb. Gryphius; and divers of his acquaintance, meeting with any of them, bought and brought them to him, which he accepted as choice presents, although perhaps he had one or two of them before. He said, that the black Italic character agreed with his eye-sight (which he accounted but weak) better than any other print, the old Elzevir not excepted, whereof the characters seemed more blind and confused than those of the other."

"His soul was never so staked down as in an old bookseller's shop; for having (as the statutes of the college required) taken orders, he was restless till he had compassed some of that sort of furniture, as he thought necessary for his profession. He was, for the most part, his own factor, and seldom or ever bought by commission; which made him lose time in turning over vast numbers of books, and he was very hardly pleased at last. I have borne him company at shops for hours together, and, minding him of the time, he hath made me a dozen profers before he would quit. By this care and industry, at length, he made himself master of a very considerable library, wherein the choicest collection was Greek."

The mention of his brother's love of book-collecting, leads the biographer to lament over the changes in the booksellers' trade, which contains some curious information relative to that important and all-necessary craft.

"It may not be amiss to step a little aside to reflect on the vast change in the trade of books between that time and ours. Then, Little Britain was a plentiful and perpetual emporium of learned authors; and men went thither as a market. This drew to the place a mighty trade; the rather because the shops were spacious, and the learned gladly resorted to them, where they seldom failed to meet with agreeable conversation. And the booksellers themselves were knowing and conversable men, with whom, for the sake of bookish knowledge, the greatest wits were pleased to converse. And we may judge the time as well spent there, as (in latter days) either in tavern or coffee-house; though the latter hath carried off the spare hours of most people. But now this emporium is vanished, and the trade contracted into the hands of two or three persons, who, to make good their monopoly, ransack, not only their neighbours of the trade that are scattered about town, but all over England, aye, and beyond the sea too, and send abroad their circulators, and in that manner get into their hands all that is valuable. The rest of the trade are content to take their refuse, with which, and the fresh scum of the press, they furnish one side of a shop, which serves the sign of a bookseller, rather than a real one; but, instead of selling, deal as factors, and procure what the country divines and gentry send for, of whom each hath his book-factor; and, when wanting any thing, writes to his bookseller, and pays his bill. And it is wretched to consider what pick-pocket work, with help of the press, these demi-booksellers make. They crack their brains to find out selling subjects, and keep hirelings in garrets, at hard meat, to write and correct by the groat; and so puff up an octavo to a sufficient thickness, and there's six shillings current for an hour and an half's reading, and perhaps never to be read or looked upon after. One that would go higher, must take his fortune at blank walls, and corners of streets, or repair to the sign of Bateman, Innys, and one or two more, where are best choice and better pennyworths. I might touch other abuses, as bad paper, incorrect printing, and false advertising, all which, and worse, is to be expected, if a careful author is not at the heels of them. But I fear I am led by these too far out of my way."

It was not the Doctor's practice, like too many collectors, to purchase books for the purpose of adorning his shelves; for he appears to have mastered and commented on their contents, with no ordinary ability and industry. For every author whom he made the subject of his book, he kept a book which he filled with annotations, until he had a considerable body of them. To the study of Greek he appears to have paid his chief attention, and so qualified himself to fill the chair of the Greek professor, to which he was afterwards elected. He seems, however, scarcely to have neglected any department of literature, and was enabled to attend to all by the admirable economy of his time.

"Greek became almost vernacular to him, and he took no small pains to make himself master of the Hebrew language, and seldom failed carrying an Hebrew Bible (but pointed) to chapel with him. He was a notable husband of his time, and

contrived to make his very scraps and *intercalary minutes* profitable; and, accordingly, during those short intervals between dressing and dinner, and such like attendances, when he could not engage in the texture of his study, he used to get the best penned English books, and read them aloud; which he said he did to form and improve his English style and pronunciation. And on such occasions he used to say it was pity to lose any of his time. And for the advantage of his Latin he used to keep his accounts in that language, and as near the classic as he could."

His relaxations from study were few and simple. Society, late in the evening, after a hard day's work, he loved. Music, too, was also a favourite resource, and he began to indulge himself on the organ, till "his under neighbour, a morose and importune master of arts," took to playing at bowls in his room, in order to show his sense of the disturbance, and retaliate on the musician. His morbid sensibilities appear to have found an innocent and amiable amusement in cultivating spiders, and observing their habits and modes of life. Roger North had either a similar taste himself, or had got his information from his brother, for he enlarges upon the subject.

"The Doctor had found out one petit entertainment in his study, besides books; and that was keeping of great house-spiders, in wide-mouthed glasses, such as men keep tobacco in. When he had them safe in hold, he supplied them with crumbs of bread, which they ate, rather than starve. But their regale was flies, which he sometimes caught and put to them. When their imprisonment appeared inevitable, they fell to their trade of making webs, and made large expansions and more private recesses. It pleased him to observe the animals manage their interests in the great work of taking their prey. If it was a small fly given to them, no more ceremony, but take and eat him; but if a great master flesh fly, then to work, twenty courses round, and perhaps not come near him, for he had claws sharp as cats, and, after divers starts to and fro, a web was with an hind leg dexterously clapt over two or three of his legs: after all his claws were in that manner secured, then, at a running pull, a broad web was brought over him, which bound him hand and foot, and, by being fixed to the spider's tail, the fly was carried off into one of his inmost recesses, there to be feasted upon at leisure."

* His love of society, and his manner in it, are thus mentioned:—

"When the Doctor was abroad, and absent from his studies, either by visits, friendly meetings or attendances, his chief delight was in discourse. And he would apply himself to all sorts of company in a brisk and smart manner; for he was very just and ready in his speech, facetious, and fluent, and his wit was never at a nonplus. I have known him at act, keep suppers as merry as the best, and, though he drank little or nothing, he sparkled and reparteed, not only saving himself harmless, (for the sober man is commonly the mark) but returning bite. His sobriety was so extraordinary, that, with entire assurance, I can affirm, that never in all his life did he know what a cup too much (as they term it) was. And this continence was more singular in him, who was really a wit in conversation, and his company desired by all people that knew him; and it is well known how much such qualifications induce men to come under the jurisdiction of the bottle. But this abstemiousness in extremity proved of ill consequence to his health, as will be showed in fit place."

It appears, however, that he did not relish the society of his college. "He did not love morosity and sour looks," which caused him to look out for another residence in the university, more agreeable to his taste. He accordingly resigned his fellowship, and took up his abode in Trinity, where, it seems, he perceived more of the humane and the polite, than in the lesser colleges; and, above all, his inducement was his value for the more than thrice excellent master, Dr. Barrow.

"He had long ago contracted a familiar acquaintance, I may say friendship, with him, and they used each other in a most delightful communication of thoughts. The good Dr. Barrow ended his days in London, in a Prebend's house that had a little stair to it, out of the cloisters, that made him call it a man's nest, and I presume it is so called to this day. The master's disease was an high fever. It had been his custom, contracted when (upon the fund of a travelling fellowship) he was at Constantinople, in all his maladies to cure himself with opium; and, being very ill, probably he augmented his dose, and so inflamed his fever, and at the same time obstructed the crisis; for he was a man knocked down, and had the eyes as of one distracted. Our Doctor seeing him so, was struck with horror; for he, that knew him so well in his best health, could best distinguish; and when he left him, he concluded he should see him no more alive, and so it proved."

The biographer, in describing the college habits of his brother, introduces some observations on the manners of the university in his time, which are interesting to those who have an opportunity of comparing them with their own very different experience.

"The Doctor conformed to all the orders of the college, seldom ate out of the hall, and then upon a fish day only, being told it was for his health. He was constantly at the chapel prayers, so much, as one may say, that, being in town, he never failed. This, in the morning, secured his time, for he went from thence directly to his study, without any sizing or breakfast at all. Whilst he was at Jesus College, coffee was not in such common use as afterwards, and coffee-houses but young. At that time, and long after, there was but one, and that kept by one Kirk. The trade of news also was scarce set up; for they had only the Public Gazette, till Kirk got a written news letter circulated by one Muddiman. But now the case is much altered; for it is become a custom, after chapel, to repair to one or the other of the coffee-houses, for there are divers, where hours are spent in talking; and less profitable reading of newspapers, of which awarins are continually supplied from London. And the scholars are so greedy after news, (which is none of their business,) that they neglect all for it, and it is become very rare for any of them to go directly to his chamber after prayers, without doing his suit at the coffee-house; which is a vast loss of time, grown out of a pure novelty; for who can apply close to a subject, with his head full of the din of a coffee-house. I cannot but think, that since coffee, with the most, is become a morning refreshment, the order, which I knew once established at Lambeth-house, or somewhat like it, might be introduced into the colleges, which was for the chaplains and gentlemen officers to meet every morning in a sort of still-house, where a good woman provided them with liquors, as they liked best; and this they called their coffee-house."

But, to return to the Doctor himself. Soon after he took orders, it fell to his lot to preach before the king, (Charles II.) at Newmarket. "This was a great trial of his spirits, and he went with great reluctance of mind; but reason and resolution prevailed. He said, that he made it a law to himself to confine his view, above the people, to a certain space, which he was not to exceed; and in speaking to a multitude, it is a good rule to mind none of them." Mr. North managed to succeed both with the king and the ladies.

"The king was pleased to signify his approval of it by saying, as he came out of the church, that the preacher would soon be a bishop; and if his majesty had lived a little longer, he might have proved himself a prophet; but his, as well as the Doctor's untimely death, fell in the way of that event. The ladies also were pleased to accept the Doctor's discourse. One of them, being asked how she liked Mr. North's sermon, said, that he was a handsome man, and had pretty doctrine."

Of the Doctor's person, which the lady admired, there is a very minute description, drawn in a manner not much unlike the style of Defoe, which indeed that of the biographer frequently resembles.

"As to his person and constitution, excepting only the agreeable air of his countenance, and florid head of flaxen hair, I have little to produce that may be commended. His temperature of body, and his austere course of life, were ill matched, and his complexion agreed with neither; for his face was always tinted with a fresh colour, and his looks vegete and sanguine, and, as some used to jest, his features were scandalous, as showing rather a madam entravestrie, than a book-worm. But his flesh was strangely flaccid and soft, his going weak and shuffling, often crossing his legs, as if he were tipsy, his sleep, seldom or never, easy, but interrupted with unquiet and painful dreams, the reposes he had were short and by snatches,—his active spirit had rarely any perfect settlement or rest."

His mind seems always to have been in a state of fermentation, which fretted "his pigmy body to decay."

"It is certain he was overmuch addicted to thinking, or else he performed it with more labour and intenseness than other men ordinarily do; for, in the end, it will appear he was a martyr to study. He scarce ever allowed himself any vacation; what he had, was forced upon him. There was no undertaking, no occurrence, how trivial soever, whereof all the circumstances or emergencies that possibly might concern him, were not valued and revolved in his mind, lest he should be so unhappy as to oversee any, as if mere trifles had been cardinal to the interests of his whole life. If he was to ride to his father's house, walk to church, or make any visit in town, he was in pain about the contingents, and so low as to fret at the fancy he had, that the people in the street looked on him. He was, in a word, the most intense and passionate thinker that ever lived and was in his right mind."

He shared with the fastidious Gray, to whose character the Doctor's bears a striking resemblance, a great dissatisfaction with his own works, together with a morbid longing after perfection in his productions; and what brings the comparison more home, he had, like the poet, an utter dislike to have his likeness taken. To such a pitch indeed had this disgust risen,—such unnatural importance did it occupy in his mind,—that he seems to have been haunted with the idea, that the mere impression of his person was laid in wait for; as he actually, every morning, designedly obliterated the print in the bed where he had lain.

"He was always exceeding thoughtful and full of notions. He could not rest from working upon his designs, and, at the same time, so diffident of the event, that, between impulse and despair, he was like Mahomet in his tomb, or, as they say, Erasmus, hung. Despair had the greatest influence; and it sat so hard upon his spirits, that he desired rather to be utterly forgot, than that any memorial of his dealings in literature should remain, to show that such a one as he existed, which should not be proof against the teeth of the next ages. After he had the government of himself, he would not endure that a picture should be made of him, though he was much courted and invited by Sir Peter Lely to it. And what was very odd, he would not leave the print in his bed where he had lain, remain undefaced."

He was also like Gray in this respect—that all his deep and long continued researches came to nothing. The only evidence of the learning and application of both of them, was a heap of notes. Those of Gray have lately seen the light;—the papers of North were all, by his especial direction, before his death, committed to the flames. If the task had been left to his younger brother, we may guess from his language, and, indeed, from his having disobeyed the injunction, in the only instance within his power,—in spite of "the pleasant impression,"—that the world would have been the better for the industry of this elaborate thinker.

"—And must profess under no small concern, that all his books and papers fell not into my hands as those did. It had been a shrewd temptation to have snapt a parole or trust prejudicial to no account but of the fire. But his humour was to hold all within himself, till he was entirely satisfied that no slip or oversight might give disadvantage to his cause or himself, lest any less guarded words or expressions should escape him. Nothing could have secured him better in that point, than the participation of his friends. In a critic of works, an author has but one eye upon his own; but, upon another's, he hath two, and spectacles to boot. He was so deeply concerned for his cause, as well as his own esteem, that he durst not trust even a friend with either. And he had a dread lest this little note book, of which I have given an account, might happen to stray, and fall into unknown persons' hands, who possibly might misconstrue his meaning. In contemplation of which contingent, he wrote upon it this pleasant imprecation:—*I besrew his heart, that gathers my opinion from any thing he finds wrote here.*"

After Dr. Barrow's death, Dr. North was appointed to succeed him in the mastership of Trinity, an elevation which might be supposed to put the crown on the honourable ambition of a retired and studious scholar. With his rise to this dignity, however, ended all the happiness which his peculiar temperament had hitherto allowed him to enjoy. In place of retirement, he found solitude; the social converse in which he had, till now, indulged, seemed unbecoming the gravity of his station; and what more than all tended to render the change a miserable one, he found himself thwarted by the eight senior fellows, who had, during the time of the two last masters, governed the college without interference. When the new master began to exert his authority, the seniors opposed him, and he was quickly involved in quarrels, which, harassing his feeble and sensitive frame, hastened his death. Being near his end, he ordered that he should be buried in the outward chapel, that the fellows might *trample upon him dead, as they had done living.*

The austere and abstemious course of life which he led, would, however, conduce as much as any thing to bring on the fatal sickness which terminated in his death. He is here drawn with the manners of a hermit, and the spirit of a martyr.

"I have already accounted for his thoughtful and studious course of life, and habitual fullness and care in his mind. But after he came into a post of magistracy, all his solitudes exasperated, and the ordinary refreshments, which he sometimes met with before, failed. And I must add, that as his course of life, so his diet, was severe to himself, for he was always sober and temperate, and scarce spared the time of eating from thinking. After morning prayer and a solitary dish of coffee, he retired to his study at the end of a gallery, and there he was fast till noon, unless college or university affairs called him out. After his meals, a meagre dish of tea, and then again to his post till chapel and supper; and then if he had any friendly conversation, it was still in a studious way; that is, discoursing of abstruse matters, which, however pleasant to him, kept his head at work. His chief remissions were when some of his nearest relations were with him, or he with them: and then, as they say, he was whole-footed: but this was not often, nor long together. Some of them used to be free with him; and, in his own way, between jest and earnest, tell him he must indulge a little, go abroad, and be free with a glass of wine, with good company, in his college, as he used to be with them: that his self-denial would endanger his life, and the like. To which sort of discourse, I have heard him return a tradition of Bishop Wren, who, when he was told he must not keep Lent, his body would not bear it, *Will it not, said he, then it is no body for me.* And the Doctor, by his life of perpetual thinking, had settled his mind in a resolution so stiff, that he often seemed rather morose and humour-some, than, as his constant profession was, to be governed by reason. When his friends have been importunate with him, to say (in the common forms of free converse) *Why? and for what reason?* He hath answered, *Reason is to govern me, but my will is a reason to every body else.*"

Such at length was the state of his health, that he was compelled to withdraw from every thing which might, in the slightest degree, disturb the equanimity of his mind. He could no longer play his part in a college wrangle, which, at first, he had done with a great deal of readiness and decision, for the penalty was a fit. And it is remarkable, that during an occasional interference of this kind, the fatal stroke was inflicted, which soon hurried him to his grave. It was determined in a meeting of the master and seniors, which had not passed without considerable dispute, that two of the students of the college should be admonished for being disorderly. The master was reprimanding them with more than usual acrimony and warmth, when, in the act of speaking, he dropped on the floor. This fit deprived him of the use of one side, and he never regained the entire use of his faculties. He, however, in some measure, recovered, and dragged on a miserable existence till he died, in 1683, aged a little more than thirty-eight years, and was buried in the ante-chapel, as he had himself directed. After the paralytic stroke, just mentioned, when he had partly come to his senses, he gave to his brother this extraordinary account of his feelings during the access of the fit.

"He told me the images in his mind during this infliction, as far as he could remember them. First, during his admonishing, he perceived himself to lean towards the left side; and the leg that should have sustained him seemed to have lost its bone, and to be like the finger of a glove; by which it was plain to him, that he must fall, and accordingly he gave way to it. After this, he remembered nothing at all that had happened to him, until, by the help of his mother, he had taken a little rest. And then, in a dreaming manner, his conceit was, that he had got a strange leg in bed with him, and was much perplexed which way to get rid of it; whether he should call to have it taken away or not. And it was a great while before he could bring himself, even awake, to own it."

The biographer then proceeds to narrate the situation of his brother after his partial recovery, and gives this awfully affecting picture of an intellect in ruins.

"It is an uneasy task, but (according to the profession I make of truth for better or worse) necessary to show the miserable decay of the Doctor's thinking and memorial capacities. What is the difference between manhood and puerility, but that the former hath a large stock of useful memoirs, and also strength habituated to action, which the latter wanting, runs after levities, and any thing for variety, without choice, unless appetite or inclination (and even that flows from experience) draws it. Suppose an hurricane to fall upon a sound man's memory, and obliterate great part of his collections, and confuse the rest, as one may imagine a fine poem wrote upon the sands, and much ruffled by the wind—there may be enough left to show it had been good sense, but the dignity of the verse lost. So the man would lose his judgment of true values, and relapse into a sort of puerility, but still his moral character, that is his will to do good or evil, remains unaltered. This was the case of our good Doctor. The seat of his memory was ruffled by the disease falling upon his brain and nerves, which had made such havoc, that he had no firm notion of himself or of any thing, but had his experience to gather, and his understanding to frame over again. After he could lie awake and think, I guess he had some reflection, that he had been over severe with himself by too much hard study and abatemiousness, which, possibly, brought that disease over him: and then fancied, he must cure himself by a course clean contrary; and accordingly he thought, that now he must be merry and jolly. Pursuant to this (conjectured) model, the company that assisted about his bed to entertain him, must find merry tales to tell, and if a little smutty the mirth paid for it. The lighter sort of books and frivolous comedies were read to him, and he heard them with notable attention, and at the quaint passages was usually affected, and often laughed, but (as his visage was then distorted) most deformly. After

he was enfranchised from his bed, and had the entertainment they call walking about his chamber, and divers friends and acquaintance came and staid with him, he gathered some little strength. But his levities still continued; and he used to please himself with rehearsing paltry rhymes and fables, and what with difficulty of utterance (for his speech was touched and never perfectly recovered) and what with his unseemly laughing, it was long before he could get any thing well out: and, at last, he made but broken stuff of it. All this was inexpressible grief and mortification to his friends, seeing that dismal alteration. They had known his genius bright; and, in his health, solemn, grave, and instructive; and his mirth, when it happened, not without a flow of pleasant wit, and, as it ought to be, ever decent and without offence, far from all suspicion of a possibility that such levity of humour and discourse should ever appear in him. He seemed as a high flying fowl, with one wing cut. The creature offers to fly, and knows no cause why he should not, but always comes with a side turn down to the ground. The Doctor had some remembrances of his former forces, when he could mount up and fly; now, his instruments on one side failing him, he was forced to deal in low concerns and reptile conceits, that scarce rose from the ground."

We shall add nothing to weaken the effects of a lesson so striking.

Come, man!

Hyperbolized nothing! know thy span;
Take thine own measure here, down, down, and bow
Before thyself in thy idea, thou
Huge emptiness contract thy bulk, and shrink
All thy wild circle to a point!

FROM THE ANNALS OF PHILOSOPHY.

Account of an Assemblage of Fossil Teeth and Bones of Elephant, Rhinoceros, Hippopotamus, Bear, Tiger, and Hyana, and 16 other Animals; discovered in a Cave at Kirkdale, Yorkshire, in the year 1821: with a Comparative View of five similar Caverns in various Parts of England, and others on the Continent. By the Rev. William Buckland, F.R.S. F.L.S. Vice-President of the Geological Society of London, and Professor of Mineralogy and Geology in the University of Oxford, &c.*

HAVING been induced in December last to visit Yorkshire, for the purpose of investigating the circumstances of the cave, at Kirkdale, near Kirby Moorside, about 25 miles N. N. E. of the city of York, in which a discovery was made last summer of a singular collection of teeth and bones, I beg to lay before the Royal Society the result of my observations on this new and interesting case, and to point out some important general conclusions that arise from it.

The facts I have collected seem calculated to throw an important light on the state of our planet at a period antecedent to the last great convulsion that has affected its surface; and I may add, *in limine*, that they afford one of the most complete and satisfactory chains of consistent circumstantial evidence I have ever met with in the course of my geological investigations.

As I shall have frequent occasion to make use of the word *diluvium*, it may be necessary to premise that I apply it to those extensive and general deposits of superficial gravel, which appear to have been produced by the last great convulsion that has affected our planet; and

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that with regard to the indications afforded by geology of such a convulsion, I entirely coincide with the views of M. Cuvier, in considering them as bearing undeniable evidence of a recent and transient inundation.* On these grounds I have felt myself fully justified in applying the epithet *diluvial* to the results of this great convulsion, of *antediluvial* to the state of things immediately preceding it, and *post-diluvial* or *alluvial* to that which succeeded it, and has continued to the present time.

In detailing these observations, I propose, first, to submit a short account of the geological position and relations of the rock in which the cavern alluded to is situated; to proceed, in the next place, to a description of the cavern itself; then to enter into that which will form the most important part of this communication, a particular enumeration of the animal remains there inhumed, and the very remarkable phenomena with which they are attended; to review the general inferences to which these phenomena lead; and conclude with a brief comparative account of analogous animal deposits in other parts of this country, and the Continent.

Kirkdale is situated about 25 miles N. N. E. of the city of York, between Helmsley and Kirby Moorside, near the point at which the east base of the Hambleton hills, looking towards Scarborough, subsides into the vale of Pickering, and on the S. extremity of the mountainous district known by the name of the Eastern and the Cleveland Moorlands.

The substratum of this valley of Pickering is a mass of stratified blue clay, identical with that which at Oxford and Weymouth reposes on a similar limestone to that of Kirkdale, and containing subordnately beds of inflammable bituminous shale, like that of Kimeridge in Dorsetshire. Its south boundary is formed by the Howardian hills, and by the elevated escarpment of the chalk that terminates the Wolds towards Scarborough. Its north frontier is composed of a belt of limestone, extending eastward 30 miles from the Hambleton hills, near Helmsley, to the sea at Scarborough, and varying in breadth from four to seven miles; this limestone is intersected by a succession of deep and parallel valleys, (here called dales) through which the following rivers from the moorlands pass down southwards to the vale of Pickering, viz. the Rye, the Rical, the Hodge Beck, the Dove, the Seven Beck, and the Costa; their united streams fall into the Derwent above New Malton, and their only outlet is by a deep gorge, extending from near this town down to Kirkham, the stoppage of which would at once convert the whole vale of Pickering into an immense inland lake; and before the excavation of which, it is probable, that such a lake existed, having its north border nearly along the edge of the belt of limestone just described, and at no great distance from the mouth of the cave at Kirkdale.

* Analogous evidences to the same point, collected in this country from the state of the gravel beds and valleys in the midland parts of England, have recently been published by myself in a paper on the Lickey Hill, in the second part of the fifth volume of the Geological Transactions, and in the appendix to an inaugural lecture I published at Oxford, in 1820. Another paper of mine on similar evidences afforded by the valleys that intersect the coast of West Dorset and East Devonshire, will be published in the first part of the sixth volume of the Geological Transactions.

The position of the cave is at the south and lower extremity of one of these dales (that of the Rical Beck), at the point where it falls into the vale of Pickering, at the distance of about a furlong from the church of Kirkdale, and near the brow of the left flank of the valley, close to the road. This flank slopes towards the river at an angle of 25° , and the height of the brow of the slope above the water may be about 120 feet.

The rock perforated by the cave is referrible to that portion of the oolite formation which, in the south of England, is known by the name of Oxford oolite and coral rag: its organic remains are identical with those of the Heddington quarries near Oxford, but its substance is harder and more compact, and more interspersed with siliceous matter, forming irregular concretions, beds, and nodules of chert in the limestone, and sometimes entirely penetrating its coralline remains. The most compact beds of this limestone resemble the younger alpine limestone of Meillierie and Aigle, in Switzerland, and they alternate with, and pass gradually into, those of a coarser oolitic texture; and both varieties are stratified in beds from one to four feet thick. The cave is situated in one of the compact beds which lies between two others of the coarser oolitic variety; the latter vary in colour from light-yellow to blue; the compact beds are of a dark grey passing to black, are extremely fetid, and full of corals and spines of the *echinus cidaris*. The compact portions of this oolite partake of the property common to compact limestones of all ages and formations, of being perforated by irregular holes and caverns intersecting them in all directions; the cause of these cavities has never been satisfactorily ascertained: into this question (which is one of considerable difficulty in geology) it is foreign to my present purpose to inquire any further than to state that they were neither produced, enlarged, or diminished by the presence of the animals whose bones we now find in them.

The abundance of such caverns in the limestone of the vicinity of Kirkdale is evident from the fact of the engulfment of several of the rivers above enumerated in the course of their passage across it from the eastern moorlands to the vale of Pickering; and it is important to observe that the elevation of the Kirkdale cave, above the bed of the Hodge Beck, exceeding 100 feet, excludes the possibility of our attributing the muddy sediment we shall find it to contain, to any land flood or extraordinary rise of the waters of that or any other now existing river.

It was not till the summer of 1821 that the existence of any animal remains, or of the cavern containing them, had been suspected. At this time, in continuing the operations of a large quarry along the brow of the slope just mentioned, the workmen accidentally intersected the mouth of a long hole or cavern, closed externally with rubbish, and overgrown with grass and bushes. As this rubbish was removed before any competent person had examined it, it is not certain whether it was composed of diluvial gravel and rolled pebbles, or was simply the debris that had fallen from the softer portions of the strata that lay above it; the workmen, however, who removed it, and some gentlemen who saw it, assured me, that it was composed of gravel and sand. In the interior of the cave there was not a single rolled pebble, nor one bone, or fragment of bone, that bears the slightest mark of having been rolled by the action of water. A few bits of limestone

and roundish concretions of chert that had fallen from the roof and sides, were the only rocky fragments that occurred, with the exception of stalactite.

About 30 feet of the outer extremity of the cave have now been removed, and the present entrance is a hole in the perpendicular face of the quarry less than five feet square, which it is only possible for a man to enter on his hands and knees, and which expands and contracts itself irregularly from two to seven feet in breadth and height, diminishing, however, as it proceeds into the interior of the hill. The cave is about 15 or 20 feet below the incumbent field, the surface of which is nearly level, and parallel to the stratification of the limestone, and to the bottom of the cave. Its main direction is E. S. E. but deviating from a straight line by several zigzags to the right and left; its greatest length is from 150 to 200 feet. In its interior it divides into several smaller passages, the extent of which has not been ascertained. In its course it is intersected by some vertical fissures, one of which is curvilinear, and again returns to the cave; another has never been traced to its termination; while the outer extremity of a third is probably seen in a crevice or fissure that appears on the face of the quarry, and which closes upwards before it leaves the body of the limestone. By removing the sediment and stalactite that now obstruct the smaller passages, a further advance in them may be rendered practicable. The half corroded fragments of corals, of spines of echini and other organic remains, and the curious ledges of limestone and nodules of chert that project along the sides and roof of the cave, together with the small grooves and pits that cover great part of its interior, show that there was a time when its dimensions were less than at present; though they fail to prove by what cause it was originally produced. There are but two or three places in which, it is possible to stand upright, and these are where the cavern is intersected by the fissures; the latter of which continue open upwards to the height only of a few feet, when they gradually close, and terminate in the body of the limestone: they are thickly lined with stalactite, and are attended by no fault or slip of either of their sides. Both the roof and floor, for many yards from the entrance, are composed of horizontal strata of limestone, uninterrupted by the slightest appearance of fissure, fracture, or stony rubbish of any kind; but further in, the roof and sides become irregularly arched, presenting a very rugged and grotesque appearance, and being studded with pendent and roundish masses of chert and stalactite; the bottom of the cavern is visible only near the entrance; and its irregularities, though apparently not great, have been filled up throughout to a nearly level surface, by the introduction of a bed of mud or sediment, the history of which, and also of the stalactite, I shall presently describe.

The fact already mentioned of the engulphment of the Rical Beck, and other adjacent rivers, as they cross the limestone, showing it to abound with many similar cavities to those at Kirkdale, renders it likely that hereafter similar deposits of bones may be discovered in this same neighbourhood; but accident alone can lead to such discovery, as it is probable the mouths of these caverns are buried under diluvian sand and gravel, or postdiluvian detritus; so that nothing but their casual intersection by some artificial operations will lead to the knowledge of their existence; and in this circumstance we also

see a reason why so few caverns of this kind have hitherto been discovered, although it is probable that many such may exist.

In all these cases, the bones found in caverns are never mineralised, but simply in the state of grave bones, or incrustated by stalactite; and have no further connexion with the rocks themselves than that arising from the accident of having been lodged in their cavities at periods long subsequent to the formation and consolidation of the strata in which these cavities occur.

On entering the cave at Kirkdale, the first thing we observe is a sediment of mud, covering entirely its whole bottom to the average depth of about a foot, and entirely covering and concealing the subjacent rock, or actual floor of the cavern. Not a particle of mud is found attached either to the sides or roof; nor is there a trace of it adhering to the sides or upper portions of the transverse fissures, or any thing to suggest the idea that it entered through them. The surface of this sediment, when the cave was first entered, was nearly smooth and level, except in those parts where its regularity had been broken by the accumulation of stalagmite above it, or ruffled by the dripping of water: its substance is argillaceous and slightly micaceous loam, composed of such minute particles as would easily be suspended in muddy water, and mixed with much calcareous matter, that seems to have been derived in part from the dripping of the roof, and in part from comminuted bones.

Above this mud, on advancing some way into the cave, the roof and sides are seen to be partially studded and cased over with a coating of stalactite, which is most abundant in those parts where the transverse fissures occur, but in small quantity where the rock is compact and devoid of fissures. Thus far it resembles the stalactite of ordinary caverns; but on tracing it downwards to the surface of the mud, it was there found to turn off at right angles from the sides of the cave, and form above the mud a plate or crust, shooting across like ice on the surface of water, or cream on a pan of milk. The thickness and quantity of this crust varied with that found on the roof and sides, being most abundant, and covering the mud entirely where there was much stalactite on the sides, and more scanty in those places where the roof presented but little: in many parts it was totally wanting both on the roof and surface of the mud and subjacent floor. Great portion of this crust had been destroyed in digging up the mud to extract the bones; it still remained, however, projecting partially in some few places along the sides; and in one or two, where it was very thick, it formed, when I visited the cave, a continuous bridge over the mud entirely across from one side to the other. In the outer portion of the cave, there was a mass of this kind which had been accumulated so high as to obstruct the passage, so that a man could not enter till it had been dug away.

These horizontal incrustations have been formed by the water which, trickling down the sides, was forced to ooze off laterally as soon as it came into contact with the mud; in other parts, where it fell in drops from the roof, stalagmitic accumulations have been raised on its surface, some of which are very large, but more commonly they are of the size and shape of a cow's pap, a name which the workman have applied to them. There is no alteration of mud with any repeated beds of stalactite, but simply a partial deposit of the latter on the floor

beneath it; and it was chiefly in the lower part of the sediment above described, and in the stalagmitic matter beneath it, that the animal remains were found: its substance contains no black earth or admixture of animal matter, except an infinity of extremely minute particles of undecomposed bone. In the whole extent of the cave, only a very few large bones have been discovered that are tolerably perfect; most of them are broken into small angular fragments and chips, the greater part of which lay separately in the mud, while others were wholly or partially invested with stalactite; and some of the latter united with masses of still smaller fragments, and cemented by the stalactite, so as to form an osseous breccia, of which I have specimens.

The effect of this mud in preserving the bones from decomposition has been very remarkable; some that had lain a long time before its introduction were in various stages of decomposition; but even in these, the further progress of decay appears to have been arrested by it; and in the greater number, little or no destruction of their form, and scarcely any of their substance, has taken place. I have found on immersing fragments of these bones in an acid till the phosphate and carbonate of lime were removed, that nearly the whole of their original gelatine has been preserved. Analogous cases of the preservative powers of diluvial mud occur on the coast of Essex, near Walton, and at Lawford, near Rugby, in Warwickshire. Here the bones of the same species of elephant, rhinoceros, and other diluvial animals occur in a state of freshness and freedom from decay, nearly equal to those in the cave at Kirkdale, and this from the same cause, viz. their having been protected from the access of atmospheric air, or the percolation of water, by the argillaceous matrix in which they have been imbedded; while similar bones that have lain the same length of time in diluvial sand, or gravel, and been subject to the constant percolation of water, have lost their compactness and strength and great part of their gelatine, and are often ready to fall to pieces on the slightest touch; and this where beds of clay and gravel occur alternating in the same quarry, as at Lawford.

The workmen on first discovering the bones at Kirkdale, supposed them to have belonged to cattle that died by a murrain in this district a few years ago, and they were for some time neglected, and thrown on the roads with the common limestone; they were at length noticed by Mr. Harrison, a medical gentleman of Kirby Moorside, and have since been collected and dispersed among so many individuals, that it is probable nearly all the specimens will in a few years be lost, with the exception of such as may be deposited in public collections. By the kindness and liberality of the Bishop of Oxford (to whom I am also indebted for my first information of the discovery of this cave), and of C. Duncombe, Esq. and Lady Charlotte Duncombe, of Duncombe Park, a nearly complete series of the teeth of all these animals has been presented to the museum at Oxford; while a still better collection both of teeth and bones is in the possession of J. Gibson, Esq. of Stratford, in Essex, to whose exertions we owe the preservation of many valuable specimens, and who is about to present a series of them to our public collections in London. W. Salmond, Esq. also, since I visited Kirkdale in December last, has been engaged with much zeal and activity in measuring and exploring new

branches of the cave, and making large collections of the teeth and bones, from which I understand he also intends to enrich our public cabinets in the metropolis. I am indebted to him for a ground plan of the cave, and its ramifications. Drawings by Mr. Clift, of some of the most perfect of Mr. Gibson's specimens, have been sent to M. Cuvier, for the new edition of his work on fossil animals; copies of these have been made for me by Miss Moorland: for many other drawings, I am indebted to the pencil of Miss Duncombe; and the Rev. George Young, and Mr. Bird, of Whitby, in their History of the Geology of the coast of Yorkshire, have given engravings of some teeth that remain in their possession.

It appears that the teeth and bones which have as yet been discovered in the cave at Kirkdale, are referrible to the following 22 species of animals.

7 Carnivora.—Hyæna, tiger, bear, wolf, fox, weasel, and an unknown animal of the size of a wolf.

4 Pachydermata.—Elephant, rhinoceros, hippopotamus, and horse.

4 Ruminantia.—Ox, and three species of deer.

3 Rodentia.—Rabbit, water-rat, and mouse.

4 Birds.—Raven, pigeon, lark, and a small species of duck, resembling the *anas sponzor*, or summer duck.

The bottom of the cave, on first removing the mud, was found to be strewed all over like a dog kennel, from one end to the other, with hundreds of teeth and bones, or rather broken and splintered fragments of bones, of all the animals above enumerated; they were found in greatest quantity near its mouth, simply because its area in this part was most capacious; those of the larger animals, elephant, rhinoceros, &c. were found co-extensively with all the rest, even in the inmost and smallest recesses. Scarcely a single bone has escaped fracture, with the exception of the astragalus, and other hard and solid bones of the tarsus and carpus joints, and of the toes. On some of the bones marks may be traced, which, on applying one to the other, appear exactly to fit the form of the canine teeth of the hyæna that occur in the cave. The hyæna's bones have been broken, and apparently gnawed equally with those of the other animals. Heaps of small splinters, and highly comminuted, yet angular fragments of bone, mixed with teeth of all the varieties of animals above enumerated, lay in the bottom of the den, occasionally adhering together by stalactite, and forming, as has been before mentioned, an osseous breccia. Many insulated fragments also are wholly or partially enveloped with stalactite, both externally and internally. Not one skull is to be found entire; and it is so rare to find a large bone of any kind that has not been more or less broken, that there is no hope of obtaining materials for the construction of any thing like a skeleton. The jaw bones also, even of the hyænas, are broken like the rest; and in the case of all the animals, the number of teeth and of solid bones of the tarsus and carpus, is more than twenty times as great as could have been supplied by the individuals whose other bones we find mixed with them.

Fragments of jaw bones are by no means common: the greatest number I saw belong to the deer, hyæna, and water-rat, and retain their teeth; in all the jaws both teeth and bone are in an equal high

state of preservation, and show that their fracture has been the effect of violence, and not of natural decay. I have seen but 10 fragments of deers' jaws, and about 40 of hyænas', and as many of rats. The ordinary fate of the jaw bones, as of all the rest, appears to have been to be broken to pieces.

The greatest number of teeth are those of hyænas, and the ruminantia. Mr. Gibson alone collected more than 300 canine teeth of the hyæna, which at the least must have belonged to 75 individuals, and they are in the same proportion in other collections. The only remains that have been found of the tiger species are two large canine teeth, each four inches in length, and one molar tooth, exceeding in size that of the largest lion or Bengal tiger. There is one tusk only of a bear, which exactly resembles those of the extinct *ursus spelæus* of the caves of Germany, the size of which M. Cuvier says must have equalled that of a large horse. Of the wolf and fox there are many teeth, and others belonging to an animal which I cannot ascertain: it seems to have been nearly allied to the wolf, but the teeth are much thinner, and less strong. A few jaws and teeth have also been found belonging to the weasel. Teeth of the larger pachydermatous animals are not abundant. I have information of about 10 elephants' teeth, but of no tusk; and as very few of these teeth exceed three inches in their longest diameter, they must have belonged to very young animals. I have seen but six molar teeth of the hippopotamus, and a few fragments of its canine and incisor teeth; some of which latter are in the possession of Mr. Thorpe, of York. Teeth of the rhinoceros are not so rare. I have seen 40 or 50, and some of them extremely large ones, and apparently from aged animals. I have heard of only two or three teeth belonging to the horse. Of the teeth of deer there are at least three species, the smallest being very nearly of the size and form of those of a fallow deer, the largest agreeing in size, but differing in form from those of the modern elk; and a third being of an intermediate size, and approaching that of a large stag or red deer. I have not ascertained how many species there are of ox, but apparently there are at least two. But the teeth which occur perhaps in greatest abundance, are those of the water-rat; for in almost every specimen I have collected or seen of the osseous breccia, there are teeth or broken fragments of the bones of this little animal mixed with, and adhering to the fragments of all the larger bones. These rats may be supposed to have abounded on the edge of the lake, which I have shown probably to have existed at that time in this neighbourhood: there are also a few teeth and bones of rabbits and mice.

Besides the teeth and bones already described, the cave contained also remains of horns of at least two species of deer. One of these resembles the horn of the common stag or red deer, the circumference of the base measuring $9\frac{1}{2}$ inches, which is precisely the size of our largest stag. A second measures $7\frac{1}{2}$ inches at the same part, and both have two antlers, that rise very near the base. In a smaller species, the lowest antler is $3\frac{1}{2}$ inches above the base, the circumference of which is 8 inches. No horns are found entire, but fragments only, and these apparently gnawed to pieces like the bones: their lower extremity nearest the head is that which has generally escaped destruction: and it is a curious fact, that this portion of all the horns I have seen from the cave shows, by the rounded state of the base, that they had fallen

off by absorption or necrosis, and been shed from the head on which they grew, and not broken off by violence.

It must already appear probable, from the facts above described, particularly from the comminuted state and apparently gnawed condition of the bones, that the cave at Kirkdale was, during a long succession of years, inhabited as a den by hyænas, and that they dragged into its recesses the other animal bodies whose remains are found mixed indiscriminately with their own; and this conjecture is rendered almost certain by the discovery I made, of many small balls of the solid calcareous excrement of an animal that had fed on bones, resembling the substance known in the old *Materia Medica* by the name of *album græcum*: its external form is that of a sphere, irregularly compressed, as in the *faeces* of sheep, and varying from half an inch to an inch in diameter; its colour is yellowish-white, its fracture is usually earthy and compact, resembling *steatite*, and sometimes granular; when compact, it is interspersed with minute cellular cavities: it was at first sight recognised by the keeper of the Menagerie at Exeter Change, as resembling both in form and appearance, the *faeces* of the spotted or Cape Hyæna, which he stated to be greedy of bones, beyond all other beasts under his care. This information I owe to Dr. Wollaston, who has also made an analysis of the substance under discussion; and finds it to be composed of the ingredients that might be expected in *faecal matter* derived from bones, viz. phosphate of lime, carbonate of lime, and a very small proportion of the triple phosphate of ammonia and magnesia; it retains no animal matter, and its originally earthy nature and affinity to bone will account for its perfect state of preservation.

I do not know what more conclusive evidence than this can be added to the facts already enumerated, to show that the hyænas inhabited this cave, and were the agents by which the teeth and bones of the other animals were there collected; it may be useful, therefore to consider, in this part of our inquiry, what are the habits of modern hyænas, and how far they illustrate the case before us.

The modern hyæna (of which there are only three known species, all of them smaller and different from the fossil one) is an inhabitant exclusively of hot climates; the most savage, or striped species, abounds in Abyssinia, Nubia, and the adjacent parts of Africa and Asia. The less ferocious, or spotted one, inhabits the Cape of Good Hope, and lives principally on carrion. In bony structure the latter approaches more nearly than the former to the fossil species: to these M. Cuvier adds a third, the red hyæna, which is very rare.

The structure of these animals places them in an intermediate class between the cat and dog tribes; not feeding, like the former, almost exclusively on living prey, but like the latter, being greedy also of putrid flesh and bones:* their love of putrid flesh induces them to follow armies, and dig up human bodies from the grave. They inhabit holes which they dig in the earth, and chasms of rocks: are fierce, and of obstinate courage, attacking stronger quadrupeds than themselves, and even repelling lions. Their habit of digging human bo-

* It is quite impossible to mistake the jaw of any species of hyæna for that of the wolf or tiger kind; the latter having three molar teeth only in the lower jaw, and the former seven: while all the hyæna tribe have four.

dies from the grave and dragging them to their den, and of accumulating around it the bones of all kinds of animals, is thus described by Busbequius, where he is speaking of the Turkish mode of burial in Anatolia, and their custom of laying large stones upon their graves to protect them from the hyænas. "*Hyæna regionibus iis satis frequens; sepulchra suffodit, extrahitque cadavera, portatque ad suam speluncam; juxta quam videre est ingentem cumulum ossium humanorum 'veterinariorum,' et reliquorum omne genus animalium.*" (Busbeq. Epist. 1. Leg. Turc.) Brown, also, in his Travels to Darfur, describes the hyænas' manner of taking off their prey in the following words:—"They come in herds of six, eight, and often more, into the villages at night, and carry off with them whatever they are able to master; they will kill dogs and asses even within the enclosure of houses, and fail not to assemble wherever a dead camel or other animal is thrown, which, acting in concert, they sometimes drag to a prodigious distance." Sparman and Pennant mention that a single hyæna has been known to carry off a living man or woman in the vicinity of the Cape.

The strength of the hyæna's jaw is such, that in attacking a dog, he begins by biting off his leg at a single snap. The capacity of his teeth for such an operation is sufficiently obvious from simple inspection, and had long ago attracted the attention of the early naturalists; and, consistent with this strength of teeth and jaw, is the state of the muscles of his neck, being so full and strong, that in early times this animal was fabled to have but one cervical vertebra. They live by day in dens, and seek their prey by night, having large prominent eyes, adapted, like those of the rat and mouse, for seeing in the dark. To animals of such a class, our cave at Kirkdale would afford a most convenient habitation, and the circumstances we find developed in it are entirely consistent with the habits above enumerated.

It appears from the researches of M. Cuvier, that the fossil hyæna was nearly one-third larger than the largest of the modern species; that is, the striped or Abyssinian; but in the structure of its teeth, more nearly resembled that of the Cape animal. Its muzzle also was shorter and stronger than in either of them, and consequently its bite more powerful. The length of the largest modern hyæna noticed is five feet nine inches.

The fossil species has been found on the continent in situations of two kinds, both of them consistent with the circumstances under which it occurs in Yorkshire, and, on comparing the jaws and teeth of the latter with those of the former engraved in M. Cuvier's *Recherches sur les Ossements Fossiles*, I find them to be absolutely identical. The two situations are caverns and diluvial gravel.

1. In Franconia, a few bones of hyæna were found mixed with those of an enormous number of bears, in the cave of Gailenreuth.

2. At Muggendorf, in a similar cave.

3. At Bauman, in ditto.

4. At Fouvent, near Gray, in the department of Doubes, bones of hyæna were found mixed with those of the elephant and horse in a fissure of limestone rock, which, like that at Kirkdale, was discovered by the accidental digging away of the rock in a garden.

* Veterinam bestiam jumentum Cato appellavit a vehendo: (quasi veheterinus vel veterinus.) Pomp. Fest.

5. At Canstadt, in the valley of the Necker, A. D. 1700, hyænas' bones were found mixed with those of the elephant, rhinoceros, and horse, and with rolled pebbles, in a mass of yellowish clay.

6. Between Hahldorf and Reiterbuck, on the surface of the hills that bound the valley of Eichstadt, in Bavaria. These were buried in a bed of sand.

The four first of these cases appear to have been dens, like the cave at Kirkdale; the two latter are deposits of diluvian detritus, like the surface gravel beds of England, in which similar remains of all the other animals have been found, excepting hyænas.

It has been observed when speaking of the den, that the bones of the hyænas are as much broken to pieces as those of the animals that formed their prey; and hence we must infer that the carcasses even of the hyænas themselves were eaten up by their survivors. Whether it be the habit of modern hyænas to devour those of their own species that die in the course of nature; or under the pressure of extreme hunger to kill and eat the weaker of them, is a point on which it is not easy to obtain positive evidence. Mr. Brown, however, asserts, in his journey to Darfur, "that it is related of the hyænas, that upon one of them being wounded, his companions instantly tear him to pieces and devour him." It seems, therefore, in the highest degree probable, that the mangled relics of hyænas that lie indiscriminately scattered and equally broken with the bones of other animals in the cave of Kirkdale, were reduced to this state by the agency of the surviving individuals of their own species.

A large proportion of the hyænas' teeth bear marks of extreme old age, some being abraded to the very sockets, and the majority having lost the upper portion of their coronary part, and having fangs extremely large: these probably died in the den from mere old age: and if we compare the lacerated condition of the bones that accompany them, with the state of the teeth thus worn down to the very stumps, notwithstanding their prodigious strength, we find in the latter the obvious instruments by which the former were thus comminuted. A great number of other teeth appear to have belonged to young hyænas, for the fangs are not developed, and the points and edges of the crown are not the least worn down. I have a fragment of the jaw of an hyæna which died so young, that the second set of its teeth had not been protruded, but were in the act of forming within the jaw. Others are in various stages of advancement towards maturity; and the proportion of these is too great for us to attribute them to animals that may have died in early life from accident or disease. It seems more probable, and the idea is confirmed by the above statement of Mr. Brown, and by the fact of the hyænas' bones in the den being gnawed and broken to pieces equally with the rest, that they were occasionally killed and devoured by the stronger individuals of their own species.

But besides the evidence their teeth afford to show that the animals died at various periods of life, they present other appearances (and so likewise do the bones), of having passed through different stages and gradations of decay, arising from the different length of time they had lain exposed in the bottom of the den, before the muddy sediment entered, which, since its introduction, has preserved them from further decomposition. This observation applies equally to all the animals.

I have portions of bone and teeth that are so much decomposed as to be ready to fall to pieces by the slightest touch; these had probably lain a long time unprotected in the bottom of the den; others still older may have entirely perished; but the majority both of teeth and fragments of bone are in a state of the highest preservation; and many thousands have been collected and carried away since the cave was discovered. In all cases the degree of decay is equal in the teeth and jaw bones, or fragments of jaws, to which they are attached.

✓ *From Kotzebue's "Voyage of Discovery in the South Sea, &c. undertaken in the years 1815, 16, 17, and 18, in the Ship Rurick."*

VISIT TO THE SANDWICH ISLANDS.

On the 11th Nov. 1816, lat. $25^{\circ} 5' 55''$, long. $138^{\circ} 1' 16''$. The favourable wind from N.N.W. and N.E., which had accompanied us hitherto, left us. Strong squalls from S.W. followed it, which continued with rain and a completely covered sky. At eight o'clock P.M. it being quite dark, we saw the heaven in the zenith, for the space of fifteen seconds, so strongly illuminated, that we could distinguish the objects on the castle as clearly as in day-time.

On the 13th, we were already in lat. $23^{\circ} 46'$, without meeting with a trade-wind; on the contrary, the south-west became more fixed, and at last rather violent. At this great distance from shore, a S.W. wind between the tropics is to me a phenomenon which deserves to be mentioned.

On the 16th, lat. $22^{\circ} 34'$, long. $104^{\circ} 25'$, we had at last a calm, and we obtained the long-expected trade-wind; a change probably occasioned by the eclipse of the sun which we had. As long as the wind from S.W. continued, we noticed, every evening, strong lightning in the south.

We found the company of Mr. Elliot de Castro very agreeable; he had tried his fortune in all parts of the world, but, as soon as he had acquired a little property, he lost it again by unlucky speculations, and had even been imprisoned, once in Buenos Ayres, and afterwards in California. Two years ago he was physician and first favourite of King Tammeamea, having staid a long time on the Sandwich Islands. The king had granted him a large portion of land, and he went on very well; but his thirst for wealth drove him to Sittka, to Mr. Baranof, the consequence of which enterprise the reader already knows.

On the 21st of November, at one o'clock, P.M., we descried Mount Mauna-Roa, fifty miles from Owhyhee. Upon Elliot's advice, I resolved to double the north side of Owhyhee, in order to obtain information respecting the abode of the king, in the bay of Tocabai, where the Englishman, Young, resides. Besides the king often lives upon the island of Wahu, and there is a considerable distance saved, by avoiding the south point of Owhyhee, where ships are delayed by calms, caused by the high Mauna-Roa. The N.E. coast of Owhyhee affords a picturesque but not an inviting aspect. The land rises gradually to a great height, which disappears in the clouds. The island is said to be sterile on this side, but it seemed, nevertheless, to be very populous. Elliot said, that the land which he possessed on this side

could only be used as a pasture for his pigs. An islander came here on board, offering to sell us a fowl, and some ropes of his manufacture. Elliot, who understood his language, and was recognised by him as the king's naja, (this was the name given to him by the king,) learned from him, with some difficulty, that the king was in the bay Karakakoa, and Young (old Hanna) was on the island of Wahu. The taciturnity and timidity of the islander excited our suspicion: Elliot thought that something unpleasant had taken place on the island, and therefore we ought to use the greatest caution. While we conversed with the islander, the boat, which he had fastened to the ship by means of a rope, upset, and the man who was in it fell out, but caught hold of the rope, and dragged himself behind the ship, notwithstanding our sailing very fast. We came-to, and our dealer jumped overboard to untie it; they both had great difficulty in turning it up again, and emptying the water out of it, as the waves were constantly filling it again. As all this was done swimming, the reader may imagine how far their skill in this art went. At last they sat in it, but then they missed their oars; this however did not embarrass them, for they rowed off with their hands. At two o'clock P. M., we doubled the north point, sailing three-quarters of a mile from shore, towards Tochai Bay. Ships doubling the north point of Owhyhee should beware of sudden squalls that are usual there. We saw some murais belonging to the chiefs of this district, distinguishable by the stone enclosure and the idols within them. Several canoes filled with girls came rowing towards us, but I had no time to attend to the fair sex, and sailed as fast as possible towards Karakakoa, where I hoped to find Tammeamea. The north point of Owhyhee consists of a low land, which rises in a straight line under an acute angle to the clouds. After having reached these parts, the monsoon loses its effect, and we must expect land and sea breezes, frequently interrupted by calms and slight squalls from every quarter of the compass. We now saw Young's settlement, consisting of several houses, built in the European style, of white stone, and surrounded by banana and palm-trees; the land has a barren appearance, and is said to be scarcely capable of cultivation, consisting, for the most part, of masses of lava. A canoe, with six people, availed themselves of the calm to come on board; one of whom, who had been in Boston with an American ship, and who partially spoke English, remained on board, when requested, to serve as a pilot. He was likewise of opinion that the king was in Karakakoa, and Young in Wahu; he told us, besides, that there were two ships in Wahu and one in Karakakoa, all under the American flag. When our pilot learned that he was on board a Russian ship, he became very uneasy, and, on Elliot questioning him on the cause of his fear, he related the following: "Five months ago two Russian ships, belonging to the American Company, had stood-in here; quarrels ensued between the Russians and the natives, in which the latter, (by the account of the narrator,) appeared in a very advantageous position; the ships, on leaving the Sandwich Islands, threatened to return soon with a strong reinforcement, mentioning particularly a man-of-war, that would likewise oppose the inhabitants." We then understood the timid behaviour of the first islanders, and Mr. Elliot had some difficulty in preventing our pilot from jumping overboard. I was glad to obtain this intelligence before my meeting with Tammeamea, and now felt doubly the ad-

vantage of Mr. Elliot's presence. A complete calm kept us that day in one place.

On the 23d we advanced but little, on account of the weakness of the wind. In the morning we were visited by a canoe, which came to inquire about our ship. At the same time we were informed that the king had gone to Ti-utatua, a small bay, a few miles farther north, but where he was only to stay that night, going farther up the coast the next day. I immediately despatched a canoe to the king, informing him of the arrival of a Russian man-of-war, with friendly intentions, the commander of which wished to speak with his Majesty, and therefore requested him not to leave Ti-utatua, where he hoped to arrive to-morrow; the naja, likewise, sent the king word of his arrival. During the night, a brisk wind brought us near Ti-utatua. During the day the current ran S., and during the night N., parallel with the coast,—the consequence of the land and sea breezes.

On the 24th, at daybreak, we approached the bay; some boats, sent by the king, came to meet us, and I availed myself of the opportunity to send Mr. Elliot, with our scientific gentlemen, on shore, in order to acquaint the king with the object of our voyage. At eight o'clock, A. M., Mr. Elliot settled business to our advantage; he came on board with two of the most distinguished chiefs, one of whom was brother to the queen, who welcomed us in the name of the king. There were two athletic men, whose dress of the newest fashion at Owhyhee was very singular, consisting of a black dress-coat and a small white straw hat. I was told by Elliot, that the king had actually expected a hostile man-of-war, and had already given orders to line the whole coast with soldiers; who, to the number of 400, armed with muskets, stood already prepared. The king sent me word that he regretted that he could not come to me on board, since the jealousy of his people would not permit it; that he, himself, had a better opinion of us, after his naja had acquainted him with the object of our voyage; and, as a token of his friendly sentiments, he invited me to his camp, where he promised to treat me with a pig, baked on the ground. For my security he had ordered that one of the chiefs should remain on board, while I was on shore; whither I went, accompanied by Mr. Elliot, my lieutenant, and a chief, of the name of John Adams, he having changed his name with an European friend, as it is customary in these islands among friends. The king's camp was concealed by a neck of land, formed by bare rocks, but, having passed these, we were surprised by seeing a most beautiful landscape. We were in a small sand bay, protected against the waves, upon perfectly smooth water; a beautiful grove of palm-trees lined the shore, under the shade of which we saw several well-built thatched houses, and, through the green leaves of the bananas, on the right, two white stone houses shone, built in European style, which mixture of buildings gave to the place a singular, yet pleasing, appearance. To the left, close to the water-side, upon an artificial hill, stood the murais of the king, surrounded by large wooden statues, representing caricatures of the human form, and which are his gods. The back-ground of this valley is formed by the majestic mount, *Mauna-Nororay*, the height of which I calculated upon 1687 toises; it rises on this side rather steeply; on its declivity, green fields and valleys change to beautiful woods, between which immensely large and steep lava rocks are frequently visible. A number of

islanders, armed with muskets, stood near the coast; the king met us with some of his first warriors upon the landing-place, and shook me heartily by the hand, when we had landed. There were a great many people gathered here by curiosity, but they behaved with perfect order, and neither noise nor importunity was allowed. I now stood beside the famous Tammeamea, whose deportment and unrestrained friendly behaviour inspired me with the greatest confidence. He took me to his thatched palace, which, after the fashion of the country, consisted of one single large room; and, like all other houses here, was exposed to every wind, by which the oppressive heat is diminished. We were offered some very pretty European chairs, and, a mahogany table being set before us, we were in possession of all the furniture of the palace. Although the king has several houses built in the European style, he prefers this simple habitation, not wishing to infringe upon the manners of the country; every thing that he considers useful he imitates, and endeavours to make his people adopt it; stone palaces he deems superfluous, the thatched houses being more comfortable, and he wishes to increase the happiness, and not the wants, of his subjects: his dress consisted of a white shirt, blue pantaloons, red waistcoat, and black neckcloth; but sometimes, I was told, he dressed splendidly, having several embroidered uniforms, and other dresses. The chiefs, who during our audience were sitting on the ground, cut a very ludicrous figure in their black coats on their naked body; besides, they are generally too tight for them, being purchased from American ships, where the people seldom arrive to the height and bulk of the Sandwich chiefs. One of the ministers had the waist high up the back, the coat was buttoned with the greatest difficulty, and he perspired excessively; his misery was very evident, but fashion did not permit him to get rid of this burden. It is singular that the savages surpass even the Europeans in supporting the inconveniences imposed upon them by fashion. The sentinels at the door were quite naked, having a cartridge-box, with a pair of pistols, tied round their waists, and holding a musket in their hand. The king having poured out for us some very good wine, and having himself drank our health, I acquainted him with my intention of supplying myself here with water and wood. A dexterous and tolerably well informed young man, named Cook, was the only white person in attendance on the king, and spoke the language of the country with perfect ease; he had been mate in a ship, but had been settled for some years on this island, where he had gained the king's favour, and was in possession of a large estate; he now formed an interpreter between us. Tammeamea directed him to speak as follows:—"I am informed that you are the commander of a man-of-war, on a voyage similar to that of Cook and Vancouver, and, consequently, have nothing to do with trade; it is therefore my intention not to enter into any with you, but to supply you gratuitously with every thing my islands produce. This matter is now settled, and requires, therefore, no more mentioning. But I beg you will tell me whether it is the wish of your emperor that his subjects should begin to inconvenience me in my old age? Since Tammeamea has been king of these islands, no European has had reason to complain of any injury done him here. I have made my islands an asylum for all nations; and honestly supplied every ship that wanted provisions. Some time ago, Russians from the American colony of Pitka came here;

they are a nation with whom I never had any connexion before; they were well received, and supplied with all necessaries, but they have basely requited me, having treated my subjects on the Island of Wahu with great hostility, and threatened to conquer the islands with men-of-war. Yet, as long as Tammeamea reigns that will not take place! A Russian physician, named Scheffer, who came here some months ago, pretended he was sent by the Emperor Alexander, to botanize on my islands: now I had heard the good fame of the emperor, and was particularly pleased with his bravery; I not only permitted Mr. Scheffer to botanize, but also promised him every assistance, granted him a piece of land, with peasants, that might ensure him against any want of provisions; in short, I tried to make his abode as pleasant to him as possible, and refused him no demand. But what was the consequence of my hospitality? Even in Owhyhee he repaid my kindness with ingratitude, which I bore with patience; after this he went, by his own will, from one island to another, settling at last upon the fruitful Island Wahu, where he proved himself my worst enemy, by destroying the murai, our sanctuary, and stirring up against me, on the Island of Otuwai, King Tamary, who had submitted years ago to my government. And Scheffer is there at this moment, threatening my islands." This was the king's account, for the truth of which I can only vouch so far as that Tammeamea respects every European of good conduct who settles with him, and his being generally known as a sincere and honest man. Of Mr. Scheffer I have no personal knowledge, but I have since learnt the manner he had got on the Sandwich Islands. He served as physician in the Russo-American company ship Suwaroff, which, under the command of Lieut. Lasaref, sailed in 1813 from Cronstadt bound to Sittka. For reasons unknown to me, in 1813, Lasaref left Dr. Scheffer in Sittka, returning to Europe without a physician. Mr. Baranof, who, as the director of all the Russo-American colonies, usually resides in Sittka, and whose character is none of the best, took him under his protection, sent him, for some unknown reasons, to the Sandwich Islands, and of his conduct there my readers are informed.

I assured Tammeamea, that the bad conduct of the Russians here could by no means be attributed to the emperor, who would never countenance an illegal act from any of his subjects; but the size of his empire prevented him being early informed of such bad actions, which never remained unpunished, when they once came to his knowledge. My assuring him that the emperor had no intention of conquering his islands, pleased him very much; the glasses were immediately emptied to the health of the emperor, and he became still more open than before. With a vivacity unusual for his age, he kept up the conversation, putting various questions respecting Russia. Cook could not always translate his words, which being peculiar to the Owhyhee language, and so witty, it frequently set his ministers laughing. One of Tammeamea's wives was passing by our house, and wished me a good morning through the door, not being permitted to enter, as this was the king's dining-house. With the king's permission we took a walk with Cook, accompanied by five naked soldiers, as a guard of honour. We visited the favourite queen Kahumanna, who is mentioned by Vancouver, found the two other wives with her, and were kindly received by all of them. The house, inhabited by Kahumanna is neat-

ly built, and very clean within; the floor upon which the three ladies had seated themselves in the Asiatic manner, was covered by fine neat mattings, and they were closely wrapped-up in the finest country-stuff. Kahumanna sat in the middle, and the other wives on both sides of her, and I was invited to sit down on the floor opposite them; her inquisitive questions I answered, through Cook, to her satisfaction. Kahumanna was so polite as to cut a water melon, and present me with a piece. The chief occupation of the royal ladies is smoking, combing their hair, driving away the flies with a fan, and eating. Tammeamea does not smoke, otherwise the custom of smoking has become so prevalent, that little children begin to smoke, before they walk, and the adults carry it to such excess, as to fall down senseless, and frequently die of the stupor. The tobacco-plant, brought here by Europeans, is carefully cultivated, and has become indigenous; the smell of it is very pleasant, but the tobacco is very strong. They use no tubes; but the pipes which they always carry about them, hanging on their side, form a part of the royal ornament; they were very large, made of a dark wood, and lined with brass, a luxury which is only enjoyed by rich people who can afford it. Kahumanna took a few draughts with great zest, which prevented her from swallowing part of the smoke, making the rest pass through her nostrils; half intoxicated she handed the pipe to me, and was quite surprised at my European stupidity, when I refused, giving it to her neighbour, who, after a short time, passed it to the third wife: as soon as the pipe was empty, a new one was filled, and the circulation began again. The second occupation of the ladies is the arranging of their hair, fashionably cut short; they only suffer it to grow a few inches over their forehead, smearing it with a white, gummy substance, and then comb it upwards; the white rays thus rising above the brown face, give it a singular appearance. All the three queens were very tall, stout women, above fifty years of age, and seemed to have never been handsome. In their dress they were distinguished from other ladies by several silk shawls. Outside the door sat the king's daughter, a tolerably pretty girl, on a mat; behind her stood a little negro boy, holding a silk parasol over her head, to keep the sun from her; two other boys drove away the flies with red plumes of feathers; the whole group looked very pretty. When I was going to rise, Kahumanna stopped me, inquiring with great curiosity after Vancouver, who during his stay here had reconciled her to her husband, between whom and her there had been some difference. The intelligence of his death seemed to give her great pain. Having left the ladies, we visited the king's son. Cook told me, that this prince, as the successor, had already entered upon his father's duties, consisting of the discharge of some of the most considerable *Taboos*, the first of which is that no one is allowed to see the prince in the day-time, a crime punishable with death. Tammeamea has done this from political motives, to prevent a revolution after his death; for, as soon as the son has accomplished the first of the royal *Taboos*, he becomes sacred, is connected with the priesthood, and no one will venture to dispute the throne with him. The prince, when he has entered upon the duties of his father, is named, *Lio-Lio*, i. e. dog of all dogs, and such a beast I actually found this one. We entered a small house, where Lio-Lio, a long, stout, naked figure, lay stretched upon the ground on his belly, and only lifted up his head

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idly to look at his guests; near him sat some soldiers with muskets, who guarded the monster; a young, good-looking islander drove away the flies from him with a red bunch of feathers, and I should rather have taken him for the prince than the other. It is a pity that Tammeamea, who has gained immortal fame by his wise government, and laid the foundation of the civilization of his people, should not have a successor, who could continue his government zealously and reasonably. It would be a great advantage for navigation, if the Sandwich Islands were raised to an equal degree of civilization with Europe; and the English, who have taken the islands under their protection, should take care that, after Tammeamea's death, a sensible man succeed him, and no revolution take place. At last the dog of all dogs raised himself, idly gaping at us in a stupid, unmeaning manner. My embroidered uniform seemed to please him, and he spoke frequently about it with his naked chamberlains. I could not learn his age, as no account is kept of it; it seemed to me to be about twenty-two years. I thought that his unwieldy bulk proceeded from his habit of constantly lying down.

At noon we returned to Tammeamea's palace, where I was surprised to find barges from sixty to seventy feet long, built quite in the European style, near the shore, and which are employed in conveying provisions from one island to another. The king endeavours to entice European shipwrights into his country by paying them well. During our walk, we were constantly accompanied by a number of men and women, who were very noisy and jocular, but yet behaved with decency. Tammeamea offered us some wine, and then took us to a small neat house, close by the *murai*, where a table was set out in European style. He pretended that no pork must be eaten in the house where we had been before, on account of his wives being so near: but Young, who knew the king better, thought that he had chosen the house near the *murai*, where he usually partook of his sacerdotal meals, because he wished to offer the pig baked for us to his gods, out of gratitude for the reconciliation with the Russians. The women are interdicted, on pain of death, from being present where the men take their meals, on which account each family has, besides the dwelling house, two other buildings, one for the men's and the other for the women's dining-place. The cloth was only laid for us Europeans, and the king, with his ministers, ate nothing, although they were present, alleging that pork was *taboo* (forbidden) on that day. The pig, lying upon palm-branches in the middle of the table, was cut up by one of the ministers, with various ceremonies; moreover we were served with *patatas*, yams, and baked *taro-root*. During dinner, the king was very loquacious, addressing himself first to me, and then to his ministers, who laughed heartily at his wit. He is fond of wine, but takes it sparingly, though he always took care to keep our glasses filled. After having drank the health of us in the English fashion, he called upon us to drink that of our emperor: this being done, one of his ministers handed to me a feather tippet, made with great skill, and which was formerly worn by the king himself, on solemn occasions, the king telling me at the same time, through Cook, although he speaks English pretty well himself, "I have heard that your monarch is a great hero; I love him for it, because I am one myself, and I send him this tippet as a proof of my affection." When we had dined and left the house, the king ordered that

my rowers should be well entertained; he gave the charge of them to one of the chiefs, the cloth was laid again, they were invited to sit down, and were waited upon with the same attention which had been showed to us. A *canaka*, with a bunch of feathers to drive away the flies, stood behind each of them. Tammeamea's first walk was to the *muria*: here he embraced one of the statues, adorned with fruit and pork, saying, "These are our gods, which I worship: whether I do right or wrong in thus worshipping them, I know not, but I follow my religion, which cannot be bad, since it teaches me to do no wrong." This expression in a savage, who had raised himself in this degree of civilization by his own energy, shows much sound sense, and was somewhat affecting to me. When the king is in the *murai*, no one is allowed to enter; but we admired, in the mean time, the colossal wooden idols, being a set of the most frightful caricatures. The king soon joined us again, taking us to the house where he had first received us; we sat down on the chairs, whilst the chiefs took their places on the floor. This being the king's dining-hour, he excused himself for eating in our presence, saying, "I have seen how the Russians eat, now you may satisfy your curiosity by seeing how Tammeamea eats." There was no cloth laid, but the provisions were in a distant corner, upon banana leaves, which are used as dishes. Waiters brought them, creeping up to the king, where a chief took them, and put them on the table. The meal consisted of boiled fish, yams, *taro-root*, and a roasted bird, a little larger than a sparrow, which inhabits the tops of the hills, and, being rarely caught, is only brought to the royal table. The king ate very quickly and with an excellent appetite, but conversed all the time; instead of bread, *taro-paste* is used, thinned with water, and reduced to a soft pap, which, although the king possesses very fine plate, stands in a pumpkin shell on his right side. In this he dips his fore-finger when he is eating fish or flesh, smearing with great skill a large portion of it in his mouth, which uninviting manner of eating is used from the king down to the meanest subject. Tammeamea, who during the meal only made use of his fingers, and perceived that I noticed all his motions, said to me, "This is the custom in my country, and I will not deviate from it." His spittoon-carrier never leaves him a moment, always keeping ready the box made of wood, in the shape of a snuff-box, with a lid, which is lifted up when the king intends to spit, and then is quickly closed again. This careful preservation of the king's saliva proceeds from the superstitious belief, that while they possess this treasure, their enemies cannot afflict them with any disease by enchantment. The king having dined, I was told what provisions I was to receive from Wahu, viz. forty-three pigs, a proportionate number of fowls and geese, every kind of fruit which the island produces, and as much wood as I chose. The king told me he had sent for a trusty person, who was to accompany me to Wahu, and who was to see that his orders were strictly fulfilled; besides, I should have some one to accompany me into the harbour of Wahu, which privilege is not otherwise granted to Russian ships. I presented to the generous king, in the name of the emperor, two metal eight-pound mortars, with all their appurtenances, on the carriages of which the name Rurick was cut; besides which, I gave him a quarter of a pipe of wine, his stock of that article being exhausted, and I promised to send him some bars of iron from Wahu, which he needed in the construction of

his boats. Some very fine large apples, which I had brought from California were somewhat new to the king; he immediately distributed a few of them among his ministers, and, as they all found them very good, the pips were preserved, to ascertain whether the tree would grow in their islands, and of which I had no doubt. The skill of our draughtsman, who had sketched some of the chiefs in a most happy manner and very quickly, was admired even by Tammeamea, but who a long time resisted my solicitations to have himself, as they say here, put upon paper, probably fearing some enchantment; and it was only when I told him that our emperor would be glad to have his portrait that he consented to it. Mr. Choris succeeded admirably well in taking his likeness, although Tammeamea, to make it more difficult, would not sit still for a moment, but was making grimaces all the time. At five o'clock in the afternoon we took leave of the king. An attendant not having yet arrived, I promised to wait for him near the land. A well-made quiet horse, which he had obtained from an American ship, he kept as a curiosity, and suffered it to run about free. A number of little boys near the shore had hardened the sand by stamping on it, and drew on it, with ability, the Rurick under sail. I was obliged to separate from Mr. Elliot, whom the king wished to have again; to whom probably we were indebted for our friendly reception. It was sunset, our attendant had not yet arrived, and, the proximity of the land being dangerous to our ship, I fired a gun, to remind the king of his promise. At eight o'clock, Mr. Cook arrived with my attendant, accounting for the delay by his having to come from the interior. He was a lively sensible man, named Manuja: although not a chief, he possessed the king's confidence in the highest degree, who specially showed it by entrusting to his care some of the most valuable European goods. Cook told me that Tammeamea took no notice of the rank of his subjects, generally choosing his confidants from among the lower orders, and he was seldom deceived in his choice. He treats his nobility with justice, but severity; and, having little confidence in them, he generally obliges them to accompany him on his journeys, by which means he deprives them of any opportunity they might otherwise have of conspiring against him. They have not forgotten that Tammeamea is the conqueror of the lands, and they would undoubtedly try to regain their dominions, if he did not know how to keep them in subjection. With the assistance of a gentle land-breeze, which always springs up here after sunset, we began our course to Wahu. I would advise every navigator sailing from Owhyhee to Wahu, to keep near the coast, where the land and sea breezes are the strongest, while, at a distance of a few miles from the land, calms caused by the Mauna-Roa are constant. On reaching the channel between Owhyhee and Muve he will find the true trade-wind, which will carry a vessel straight to Wahu, without having any thing to fear from the Mauna-Roa. For those of my readers who may not understand what is meant by land and sea-breezes, a short explanation may not be without interest. Nearly all high islands between the tropics are perpetually exposed to the trade-wind, the coast situated under the wind, that is to say, the one opposite to that on which the trade-wind blows, produces, in the day-time, a wind from the sea, which blows upon the land, while at night it blows in a contrary direction. The explanation of this phenomenon is very easy: in the day time the land is so heated by the sun that it is warmer than the

sea; whence it is that the air rushes from the cooler parts to the warmer, and produces what is called a sea-breeze. At night it is the reverse; the sea is warmer than the land, and produces the land-breeze.

On the 25th of November, we were becalmed nearly the whole day; the islands of Owhyhee and Muve rose in gigantic importance on each side of us. From my measurements I found that the heights of the highest hills in Owhyhee and Muve were as follow:—

Mauna-Roa, in Owhyhee	2482,4 toises.
Mauna-Koah, do.	2180,1 —
Mauna-Wororai, do.	1687,1 —
Highest peak in Muve	1669,1 —

During the night of the 26th, we were obliged to keep near Wahiiti Bay. In Owhyhee they said that the current near Wahu ran so strong to the west that we ought to take care not to get under the wind of the island; but I experienced the reverse, finding, at daybreak, that a current had drifted us eight miles to the S.E. although the wind blew very strong from that direction, and the ship was very much tossed about.

Early on the 27th, I steered towards the west point of *Wahiiti* Bay, distinguishable by the sugar-loaf hill upon it, called by the English, Diamond Hill, from the quartz-crystal found there, and supposed by some to be diamonds, an opinion which is still entertained, and for which reason the natives are prohibited from visiting it. This point we doubled towards noon. Wahu is known as the most fruitful island of the whole group, and is called the garden of the Sandwich Islands. The sharp-pointed rocks which form the S. E. part of the island, rising 529 toises above the sea, give no such idea, which however is confirmed on having turned the Yellow Diamond Hill, by the most beautiful prospect. Valleys covered with banana and palm-trees, in which the huts of the savages lie scattered, line the shore; behind these the land rises gradually, all the hills being covered with beautiful verdure, indicating industry. This is the southern part of the island, which runs in a straight line from east to west twenty miles, without any change in the condition of the land. Here too is seen the highest mountain on the island, which is on the N. W. part of it, and is by my calculation 631,2 toises high. We sailed by the village *Wahiiti*, (near which Vancouver anchored on a dangerous spot, without suspecting that he was close to a convenient harbour,) and already saw, through our glasses, the town Hana-rura, which lies close by the harbour of that name. We were met by a canoe with three men; Manuja hailed them, jumped into the water, and soon swam to the boat, in which he rowed to land, in order to inform the commander of the place of our arrival, and to send us a pilot. We were now near Hana-rura, where some houses, built in the European style, formed a striking contrast to the huts of the natives. In the harbour we descried a fort with Tammea's flag hoisted upon it; near it were several ships at anchor, and the whole had a European appearance. In the afternoon the governor sent us a pilot; he was an Englishman by birth, named Hebbottel, and was employed here by the king to bring all ships into the harbour that came on this coast. At the entrance of it he made us drop our anchor. The depth was eight fathoms, and the bottom was composed of coral and sand. The wind blows here the whole day from the harbour,

wherefore the ship must wait outside of it till the morning, a little before sunrise, when a calm ensues, of which advantage is taken to tow the ship into port. I was sorry to be at anchor in this place, as, by a strong south wind, which often blows near Wahu, a ship is easily lost: a reef, over which the surf broke with great violence, was only a hundred fathoms from us, and yet this is the only place where ships can come to anchor, because a little farther the depth is unfathomable; besides the condition of the anchorage was so far from being good, that our cables suffered considerably, in the space of twelve hours. The whole coast is surrounded by coral-reefs, some of which extend a mile and more into the sea, and behind these nature has formed the beautiful harbour of Hana-rura, which is protected on the sea-side by the reefs, and might be called the most beautiful spot in the world, if the entrance were not too shallow for large ships. As soon as we had cast anchor, I went on shore, to pay my respects to the governor, *Kareimoku*; but, although Manuja had gone before us, and acquainted the inhabitants with the king's orders, they were still very much terrified with the appearance of a Russian man-of-war, and betook themselves to arms. On landing, I was received by Mr. Young, an Englishman, and one of the first confidants of the king, who has lived upon these islands for twenty years, and had now been sent to Wahu to build a fort. The armed islanders sent forth the most horrible cries, but Mr. Young encouraged me, and helped me out of the boat. We went, accompanied by a number of soldiers, who kept off the importunities of the mob, to his house, where *Kareimoku*, with the chief nobility, soon joined us. Both he and his suite were dressed in the costume of the country, consisting of a large white dress, made of stuff spun from the bark of trees, and thrown in the Roman style over the right shoulder; besides which they had a cartridge-box and a brace of pistols tied round their naked waists. The whole party came from the fort, where preparations for the defence had already been made. *Kareimoku's* athletic figure, united to his noble deportment, appeared to advantage in the Roman costume; his countenance betrayed sense, which he actually possesses, for which reason the English on the island give him the name of Pitt. He welcomed me after the European manner, by shaking hands; and, having invited me to a seat, he sat down with his attendants, when my first endeavour was to prevent any suspicion concerning us. His countenance soon cleared up, and he spoke as follows: "The gods are witnesses that we have not wronged the Russians, but they have rendered us evil for good!" I assured him all that *Scheffer* (about whom he principally complained) had done here, was against the will of our emperor, and endeavoured also to quiet him respecting the future, of which he still seemed to entertain some fear: we then parted with his promising us to fulfil *Tammeamea's* orders in every respect. In the harbour lay three ships, two of which, one large three-master and a pretty brig, belonged to the king, who had purchased them for sandal. The three-master, which bears the name of *Abatross*, serves for the present as a transport, to carry provisions from Wahu to *Owhyhee*, but will in future go to Canton with sandal under *Tammeamea's* flag, to barter it for Chinese goods. The English government has bound itself to respect his flag every where, and to support his trade in Canton. The brig bears the name of the queen, *Kahumanna*; she can, according to her size, carry eighteen guns, is built for quick-sailing, like a man-of-war, and is now used by *Tammeamea* for that purpose.

On the 28th, at daybreak, we fired a signal-gun, and soon the royal pilate, accompanied by eight double canoes, each with from sixteen to twenty rowers, appeared. In each of them was the owner, called here by the English, Jerri, or Chief, to maintain order in the towing; old Young sat in a small light boat, and directed the whole. The shouts in the boats were gratifying, they joked and laughed, even the work was performed playfully, and the islanders appeared as sportive as children. We had a perfect calm; the anchors were weighed, and the canoes towed us with such violence, that the Rurick, according to the log, went three miles an hour. In half an hour we had reached the harbour, and cast anchor within a pistol-shot of the land, opposite the fort, in eight fathoms. Young now came on board, to inform me that the canoes did not belong to the king, and that I had to give to each owner three piastres, for which, as the commander of a man-of-war, I should be exempted on the payment of anchorage-fee, levied here on all merchant ships, which are obliged to pay a piastre for every foot of water that they draw. Although I thought it strange that I had not been informed of it before, I was obliged to submit to the custom, by paying forty piastres. The anchors were scarcely dropped, before a host of Sandwich women, some swimming, and others in boats, surrounded our ship; they all wished to come on board, and were mortified, when I refused them admittance. I had, in order to undertake the necessary repairs, declared the ship *taboo* for some days; the amiable nymphs, sang us some love-songs, and then turned back, surprised at our severity.

On the 29th, they began to supply us with provisions; we received daily taro, yams, cocoa-nuts, bananas, and water-melons, in abundance. The hogs were so large, that the whole of the crew could not eat one in two days; on which account more than half the number we received we did not eat; some of which I salted, and the rest I carried away alive. The pork is so well salted by a Spaniard of *Marini*, (who has been here for several years, and was formerly a favourite of the king's,) that I brought some of it to St. Petersburg in excellent preservation. In the Spanish colonies of America, the meat is not salted, because they think that, even while salting, it putrefies: in Chili they take for ship's provisions, flesh dried in the sun, and which has lost all its juice. In hot climates, particular care should be paid to the salting of meat, to take out the bones, and squeeze out the blood, by placing heavy weights upon it.

To-day, a misunderstanding roused the people against us; they had already taken up arms, and the affair would perhaps have terminated seriously, if Young had not interfered in time. The case was as follows:—the harbour of *Hana-rura* not having been, to my knowledge, surveyed by any one before, and certainly being known but to few navigators, I intended to draw a plan of it, and had therefore long poles, with flags affixed to them, fastened in the ground in several places. The sight of these flags exasperated the people, for Scheffer had once hoisted a Russian flag, saying, "I take possession of the island," and therefore they had no doubt but I was taking the first step towards a conquest. On Young's representation, I changed the fatal flags for brooms, which restored tranquillity. To gain the confidence of the people completely, I invited Kareimoku to see us the next day. The ship Abatross left Wahu to take provisions to Owhyhee.

On the 30th of November, Kareimoku came on board with his wife,

Mr. Young, and the chief nobility (*jerris*), among whom was the brother of Queen Kahumanna; also Young brought his wife, a near relation of Tammeamea. Kareimoku was very friendly; he shook my hands heartily, saying several times, "*Aroah!*" (God be with you); my guests were all in their best dresses; I could scarcely recognise Kareimoku, who appeared in the dress of an English mate, with polished boots and cocked hat; but every thing fitted him so tightly that he could not move a limb, and was almost suffocated by the heat; the other *jerris* moved about, no less pompously, but quite as uncomfortably, forming a strange assemblage of sailors, dandies, and quakers. The rage is so great here, that no person can rest without having some articles of European dress; some only walk in a shirt, some in trousers, and others strut about in a waistcoat. The Americans buy up all the clothes which have become out of fashion, and then sell them here to great advantage. One of my guests had on an immensely long coat, with buttons as large as tea-cups, with which he seemed unceasingly delighted. The ladies, on the contrary, are quite wrapt up in their native cloth (*Taffa*), only wearing a silk handkerchief about the neck. Mrs. Young, as the wife of an European, forms an exception, by dressing in rich Chinese silk, after the European fashion. Her pleasant countenance and modest behaviour formed a striking contrast with Kareimoku's wife, a tall stout woman, who behaved in a very masculine manner. There being no room in the cabin for so large a company, the cloth was laid in the forecastle, but the islanders ate nothing. I unfortunately did not know that pork must be consecrated in the *murai* before they can eat it; not only this, but all the other meats were *taboo*, having been roasted at the same fire as the pork. At my urgent request, however, they at last agreed to eat some biscuit, cheese, and fruit; the wine and spirits did not seem *taboo*, as they emptied their glasses very frequently. These islanders are passionately fond of spirituous liquors; they empty a bottle of rum at one draught, with the greatest ease, and it is inconceivable how much of it they can drink. The ladies, who were not allowed to eat in the presence of their husbands, kept closer to the wine. Kareimoku proposed the health of our emperor and Tammeamea. My guests were pleased with every thing on board, particularly with the portrait of my father, that hung in the cabin, and which they fancied was alive, till they touched it. They immediately recognised Tammeamea's portrait; and, when it became known in the country that we had Tammeamea on paper, we daily received a crowd of visitors, who wished to see him. At four o'clock my guests left the ship, well pleased with their reception, since I endeavoured to make up for their lost dinner, by some trifling presents. At sunset, this evening, a *taboo* is to begin for Kareimoku and his first *jerris*, which is to last one night and two days. The higher the people are here in rank, the more holy duties they have to perform, and every full and new moon they have each a *taboo*; as soon as the sun approaches the horizon, they enter the *murai*, which they do not leave again till the appointed time is over. Mr. Chamisso obtained permission to perform the whole *taboo* in the *murai*; he is undoubtedly the first European who has had this favour conferred on him. After Kareimoku had visited me, the inhabitants became convinced of my friendly sentiments, and I could go on shore without any doubt. I therefore went immediately to *Hana-rura*, where the inhabitants behaved very modestly, and seemed to wish me to enter their

houses; the whole of the family then collected round me, presenting me with refreshments, prattling and playing like children. Tobacco-pipes are found in every cottage, and smoking seems to be one of their chief enjoyments. The houses in *Hana-rura*, which are sometimes built together, and sometimes detached, resemble those in Owhyhee. Some Europeans, who have settled here, inhabit houses which are something between ours and theirs. The Spaniard *Merini*, who has built himself a house of stone, has introduced many useful plants, and is the only one who has a considerable flock of cattle and sheep. There is a great quantity of cattle in the interior, which, having been brought here some years since by Europeans, are said to have increased very much; however, they have become so savage, that they are only killed with muskets. Every evening a naked islander drives home *Marini's* flock, in which there are even some horses, that he brought from America. An Englishman, named Holmes, has also lived here these thirty years, and formerly occupied Kareimoku's post. As all Europeans who settle here marry Sandwich women, the original race must in time be extinct. My intention of seeing the fort was frustrated, by a sentinel calling out the word "*Taboo!*" I afterwards learned that admission is refused to every stranger, especially Europeans. Kareimoku is always in the fort, where they are still at work, and the natives not being familiar with the use of cannon, they have appointed an Englishman, named George Berkley, who had formerly served in a merchantman, as commandant. The fort is nothing more than a square, supplied with loop-holes, the walls of which are two fathoms high, and built of coral stone.

December 4. By Kareimoku's invitation, I was present at a native dance. We were taken to a house, before which a large place was prepared for the solemnity, which was already surrounded by several spectators, mats having been spread for us on the ground in the middle of the circle. The governor sent an apology, through Mr. Young, for his absence, alleging that his lady was so drunk that he could not leave her. However strange this excuse may seem, it was nevertheless true, and I was obliged to admit it. The women here are generally more addicted to drinking than the men. We sat down and the dance began immediately. The music was performed by four men, who, by striking with small sticks upon pumpkins, scooped out, produced a hollow sound, which accompanied the song. Three dancers by profession, who go from one island to another and perform for money, stepped forward, quite naked, with the exception of bracelets of boars' tusks, and leggings of dogs' teeth. They placed themselves opposite us, beside each other, and expressed, by motions of the whole body, the words of the accompanying song. They were particularly clever in changing their countenances every moment, to adapt them to the motions of the body. The spectators were enraptured, entering at every pause into the circle to bestow gifts upon the dancers, and at last, in their enthusiasm, even gave their silk handkerchiefs. The men having finished, the scene changed, and a number of young girls placed themselves in three rows. Their heads and shoulders were adorned with neat garlands of flowers, their necks with beads, and various other things, and only the lower parts of their bodies were covered with pretty *tapa*; this group looked pretty, as they made the most graceful motions to the monotonous music. The last rows fol-

lowed the first, and always imitated the motions of those who took the lead. The whole had the expression of pure nature, and gave me more pleasure than the best executed European ballet. The scene of performance was bordered by a hedge of bamboo, behind which a small house stood concealed, and a large hog, guarded by two kanakas, walked to and fro, in front, and was tenderly stroked by every passing chief; these caresses struck me, and I learned, through Young, that in the house was a son of Tammeamea's, a child nine months old, whose education had been entrusted to Kareimoku, and that this was the taboo-hog, which was to be offered to the gods when the young prince performed his first holy duties in the murai. The dance was given in honour of the little prince, although he could take no part in the amusements, and, in fact, dare not appear before a certain age: still his high birth demanded that frequent festivals should be given in honour of him.

SECOND VISIT.

On the 26th September, 1817, at seven o'clock A. M., we descried Mauna-roa, in Owhyhee; at sunset we doubled the north point of the island, and at midnight we were under the wind of it, about four miles off the shore.

On the 27th, at daybreak, we had a perfect calm, and were opposite Young's possession, near Tocahai Bay. A pretty young girl profited by the calm, and came beside the ship; her gesture clearly indicated her purpose, and she appeared very much vexed when she found herself unnoticed. Kadu was quite stupified at the sight of this nymph; he accosted her in every language of which he had some knowledge, even in Russian, and, as she did not understand him, he vehemently begged me to let her come on board, which I had good reason to refuse. He, however, threw her out all his beads, and beckoned to her as long as she remained in sight. A second boat, with five Sandwichmen, soon put him in good humour again. These savages brought us taro-root and water-melons, which they sold at a very high price, and we were informed by them that Tammeamea was just then on Owhyhee. Towards noon a gentle sea-breeze sprung up, and enabled us to advance slowly along the coast towards the south. I wished to reach Karakua Bay, where I expected to meet with the king; but, at sunset, we were again becalmed, being yet at a considerable distance from the bay.

On the 28th, when we were near the bay of Teiatatua, we were visited by two chiefs, who came out fishing, and recognised us as old acquaintances; they told us that Tammeamea was in the bay, and, after having succeeded in cheating us, they went off in great glee. Soon after we saw a second boat making towards us with great celerity, and we espied in it our old friend, Mr. Elliot, who, having recognised the *Rurick* through a telescope, followed us in great haste, as we had already passed the king's abode. We tacked about and took our course into the bay, where Tammeamea then resided for the purpose of catching bonitos. We went in Elliot's boat, which landed us at noon in the king's encampment, standing on the shore on a lava plain, where every one was exposed to the burning rays of the sun. About twenty years ago a volcanic eruption took place from a neighbouring hill; the lava ran into the sea and formed the plain, where they had pitched

their straw tents scarcely large enough to contain three people. The king lives as uncomfortably as his nobility, and, if they murmur, he tells them, justly, "I am not a straw better off than you; if I leave you on your estates you will grow as fat as your pigs, and have no other thought than that of injuring your king." After having staid two months in this place, and the patience of his chiefs was properly tried, he intended to leave it in a few days for a more pleasant abode, and this intention he announced to them by saying, "Now you will know the better how to value your comforts." Just before our arrival, Tammeamea had sailed out to fish, and, in the mean time, Elliot took us to his wives, who were sitting in the middle of the camp upon fine matting, under a screen of white sail-cloth, trying to cool themselves by eating water-melons. They were very glad to see us again; and Kahumanna made me sit down by her side, and, after having made some general inquiries, she sent for more melons. She was so polite as to order a kanaka to keep off the flies from me with a broom of red feathers; she herself cut out the inner part of a melon, and put the piece in my mouth with her own hands, in which her royal nails, three inches long, rather incommoded me. She asked me whether the favourite queen in my country was as polite to strangers as she was. I replied we had a very kind, condescending queen, and only one. This intelligence surprised her greatly, having heard that our king was a great monarch, and therefore was justified in having many wives. Kadu was an object of great curiosity; the queen was struck at the size of his ear-laps, and examined them closely. The people on hearing that he was from a newly-discovered island, collected round him in crowds; several chiefs, and even the queen, made him liberal presents; at first he looked rather timid, yet he was highly pleased, particularly when two young girls took hold of him and led him about the camp. It was about sunset when the king returned from his fishing expedition, which he carried on with hooks, at some distance from shore. Without taking time to dress himself, he came up to me naked, and shook me by the hand most heartily; one of the ministers dragged a couple of bonitos behind him, and the king said, ordering one to be laid at my feet, "This fish I hooked myself, and beg you to accept it as a testimony of my friendship." His wardrobe was then brought, consisting of a shirt, a pair of old velveteen breeches, a red waistcoat, and a black cravat; and he dressed himself without ceremony in my presence. His embroidered uniform he only wears on solemn occasions, and then very reluctantly. Once he said to Elliot, "The uniforms which King George (it is thus he calls the king of England) sent me are certainly very dazzling, but they are of no use to me, for Tammeamea outshines every thing!" While he was dressing I perceived that he had several wounds about his body, and, on asking in what campaigns he received them, he replied, pointing to the northwest, "I have conquered those islands, and the scars prove that I deserve to be king of the whole cluster." When he was dressed, he sat down near his house on a mat, under the open sky; another mat was spread out for me; and, while he continued smearing paste in his mouth, he entertained us with an account of taking the bonitos. He seemed much interested in Kadu, who felt the greatest respect for him, and whom he considered as the first tamon in the world. Having no time to lose, I immediately spoke

about the provisions which I wished to take in Wahu. The king replied, "I cannot transact any such business with you to-day, my son *Lio-Lio* having had a dream last night, which forebodes misfortune. The dog of all dogs swallowed in his dream the queen *Kahumanna*, and threw her out again as a horrible monster, which immediately set about ravaging the country; I therefore must believe that to-day you are the harbinger of misfortune." I, however, assured the king that our ship concealed no such monster as the dog of all dogs had emitted, but that, on the contrary, he had not a more sincere friend than myself; and, after much persuasion, I succeeded in being despatched the same day. One of the chiefs, *Kareimoku*, a relation of the governors of Wahu, was made to sit down on the ground to receive his commands, which were, that we should have the same quantity of provisions as we had had last year, and to receive us in the same friendly manner: then, addressing himself to me, he said, "Now you may proceed on to Wahu; take this chief with you, and he will supply all your wants; I require no payment for my provisions, but, if you have any iron to spare, you will oblige me with it, for I want it in building my ships." I willingly made this promise, and hastened to take my leave. Our attendant, young *Kareimoku*, behaved very respectfully; two kanakas who he had to wait on him showed that he was of a high rank. We advanced but slowly, owing to the weakness of the wind, and were a whole day becalmed near the isle of *Ranai*. Ships ought not to come too near this island under the wind, as the trade-wind, intercepted by its high land, cannot act here.

On the first of October, at five o'clock P. M., we at last reached the anchorage of *Hana-rura*. Soon after, a brig under American colours anchored by the side of us; the ship, which actually belonged to that nation, had been hired by *Baranof*, in *Sitka*, for the purpose of carrying a cargo of fur to *Ochotzk*, and was now returning, having discharged her cargo. I soon went on shore, whither my attendant had already preceded me in a canoe belonging to some of the natives. We found the harbour in a lively state; eight ships were lying here, six of which carried American colours, and one *Tammeamea's*; the eighth belonged to the Russo-American company, and lay upon the shore. When I approached this flotilla, the Americans gave a salute with their guns, a mark of politeness shown to me as the commander of a Russian man-of-war. On landing I was politely received by the captains, and accompanied to *Kareimoku's* house, who was very well pleased to see me again. Even from a distance he welcomed me, by exclaiming *aroah*; three shots were fired from the fort, and at every shot he pressed my hand and repeated his *aroah*. He intimated to me, by *Mr. Young*, that he had already received the king's orders, but, even without them, he would have provided for me every thing. I begged for some boats to tow me in, but the American captains kindly offered me the loan of their boats, which they promised to send the next morning.

On the 2d, at daybreak, according to the custom of the place, I fired a gun, and soon after the boats appeared, which brought us to anchor on the same spot where we had lain last year.

We had scarcely arrived, when *Kareimoku*, accompanied by *Mr. Young*, appeared on board, followed by a large boat, loaded with ve-

getables, fruit, and a large pig. I received him with three shots; the fort saluted with seven, and I answered by an equal number.

On the 6th of October, the American brig Boston came in; after having doubled Cape Horn, she had touched upon Sitka, and was now on her voyage to Canton. We purchased some biscuit from her.

Kadu had acquired several friends in this country, where many objects engaged his attention: one day he was particularly terrified by seeing a man on horseback, whom he took for a large monster. The natives took pleasure in instructing him, and, as he took a particular interest in agriculture, I entertained hopes that he would become useful to the people of Radack.

On the 8th, the captain of an American schooner struck a bargain with Kareimoku about a cargo of sandal, for which he gave him a ship lined with copper; a circumstance which shows how dearly the Americans sell this wood in China. Several ships that lay here, paid for this wood with goods or piastres, which is delivered to them by the weight in the governor's presence. I took a walk every evening on shore, which may be done in perfect security, for, although drunken people are often met with, it is just in this situation that they are merry and pleasant. They intoxicate themselves with the Awa-root, which is prepared in the same manner as on the other South sea islands, with the difference that old women only chew the root, and the young merely spit in it, to thin the paste. The unwholesomeness of this root is evident from the many sores with which the people are covered. The rich people intoxicate themselves with rum, which they purchase from the Americans. Since the introduction of spirituous liquors and tobacco, together with several diseases, by the Europeans, the population of these islands has perceptibly decreased; many fields, too, are lying uncultivated, as the natives are compelled to cut sandal-wood. On my road to the plantations, I met with two boys carrying large bundles of bananas, and, after every hundred paces, they stopped, in order to call the attention of the passengers. The men immediately threw themselves on the ground, covered their faces with their hands, and did not rise till the boys had passed by; the women were even compelled to undress themselves at the sight of the boys. I was told that this evening a great *tabu* (taboo) was to begin, the bananas were being carried to the murai, where they were to be sacrificed to the gods; therefore this kind of submission was shown to the bearers of the holy fruit. On passing by the house of a great chief I found him sitting outside the door, with some others, waiting for sunset to repair to the murai; he addressed me in a very friendly manner, but warned me against touching him, lest I should become *tabu* by it, and be obliged to go into the murai. During this dangerous time the women must not appear before their husbands, and, if one should be so unfortunate as to touch him, she is punished by death. I even saw the corpse of a woman swimming about the harbour, which was thrown at with stones by adults and children, and I was told that she had infringed a *tabu*.

On the 11th, I was attracted towards the murai by the hollow sound of a drum; but, thinking that admission was prohibited, I stopped at some distance. This being no *tabu*-day, I supposed that the persons engaged in it were priests. Two Sandwichmen came towards me, addressing me with the words, *Aroha Jeri nue* (be welcome

great chief), and invited me to enter. I was rather surprised when I obtained this permission, and was a little fearful that the priests might take a fancy to sacrifice me to their gods, and, on entering through the holy gate, I resolved to be at least upon my guard. As this *murai* was built in great haste, after the destruction of the old one, it could give me no correct idea of their sanctuary; I only found here a piece of ground of about fifty square fathoms, paved in with bamboo: in the middle of this place, six small houses, standing close by each other, formed a semi-circle; each of these chapels was surrounded by a bamboo enclosure over which the colossal heads of the gods appeared, like sentinels. The immense necks, supporting these heads, were hung with *pork*, and some of them only retained the skeleton of a rotten pig. Although annoyed by the stench, and inclined to smile at the sight of these idols, I refrained from noticing them: my surprise was therefore the greater, when the priests themselves called my attention to the caricatures, handling their noses and eyes, and trying to imitate their distorted faces, and at the same time heartily laughing at their own wit. Near one of the cottages stood two rudely finished statues, representing a man and a woman; between them a pole was driven in the ground, the top of which was hung with *bananas*. Both extended their arms towards the fruit; which reminded me of Adam and Eve, but unfortunately I had no one near me that could afford me an explanation of the allegory. The priests gave me to understand that the two statues, who held their mouths wide open, had them filled with human teeth. One of the small chapels was laid round with matting; from this issued the sound of a drum, frequently interrupted by the pitiful groans of a human being; and the whole made such a sad impression upon me, that I felt happy when I left the place. On my return I met with a large company of ladies, sitting before a house, round a fire, before which a dog was roasting. They invited me to participate in their feast, for which, however, I had no leisure. The women in these islands, who are prohibited from eating pork, indemnify themselves with the flesh of dogs, which are fed for that purpose with fruit only. There is a peculiarity in these dogs, which seems to belong to the species of our terriers, that they never attach themselves to men, and are therefore kept among the pigs.

I intended to have sailed on the 13th, but Kareimoku, who had to perform a *tabu* that day, begged me to stay till it was over, as he wished to accompany me; besides, he represented that I should have nothing but misfortune, if I sailed during a *tabu*. As he had always been very kind to me, I consented to his request, and in the mean time the ship was put in trim, and we took in all the provisions, together with a great stock of animals, such as goats, pigs, dogs, cats, pigeons, &c.

On the 14th of October, at sunrise, I was ready to leave the port, and the American captains kindly sent their boats again to tow me out. Kareimoku, who was just coming from the *murai*, told me that, on his urgent request, the gods had promised they would protect us on our voyage, that we might come into our country with whole heads and sound feet, and he doubted not for a moment but that we should have a prosperous voyage. He brought us water-melons and fish from his tank, and, behaved altogether much more friendly to us than to the captains of the merchantmen, to whom he conducted himself haughti-

ly. On parting, I made him a present of a portrait of Tammeamea, and he left me with a hearty shake of the hand, again recommending me to his gods. Young Kareimoku received the presents for the king, and shouted with joy when he put on one of my embroidered uniforms, of which I had made him a present. Soon after our friends had left us, we hoisted all our sails, and with a brisk land breeze, sailed S. W. by W. in the direction of Radack.

FROM A LATE ENGLISH PAPER.

ACCOUNT OF THE ISLAND OF JOANNAH.

Joannah, one of the Cormora Islands, is situated in latitude $12^{\circ} 5'$ south, longitude $45^{\circ} 40'$ east. We cast anchor in the roads there on the 4th of June, and had soon the pleasure of seeing at least twenty canoes making off for us: they were filled with natives, who by their kindness as well as language proved that they in some degree merited their proudest title—"Brother Englishmen." The canoes excited a good deal of interest, being each merely the trunk of a tree hollowed out, and kept upright in the water by a sort of cross-bar, which projects three or four feet on the side of the boat, and touches the water, thereby keeping the frail machine in equilibrio, while it is propelled by oars or paddles of a long narrow shape, resembling egg-spoons. The dress of the rowers is very scanty, while that of the chiefs is of all the colours of the rainbow, and every fashion which has been introduced since the days of Elizabeth. English clothes have ever been esteemed a rarity, and it is no uncommon thing to see the left-off coat of a British soldier or sailor upon the back of a right honourable! Their titles are purely English, and have been bestowed by such gentlemen as whim or good nature prompted:—It was really amusing to see the Prince of Wales, my Lord Random, Lord Rodney, and Rear Admiral Blanket selling fruit, or bartering it for old shoes, coloured cotton handkerchiefs, needles, pins, or penknives; in short, deigning even to solicit the washing of dirty linen! The island, as it appeared from the ship, was beautiful in the extreme, and Dr. G—— and myself were in consequence determined to view a little of the interior. In the morning, therefore, we set out, attended by our respective guides, each with a "Nock" in hand, hoping to do much execution. Before ten o'clock we killed several guinea-fowls, ringdoves, parrots, and magpies; and as the sun became powerful, we retired to the beach, with the intention of proceeding to the town under the friendly shade of an umbrella. Little were we aware of the honour that awaited us! we had the felicity of being introduced to majesty itself! While ranging about from house to house, Rear Admiral Blanket came up to us, "joy sparkling in his countenance," and said that he was commissioned by the king to solicit the honour of a visit! Our own comfort required a change of dress; but this we were told should be overlooked, as the king would value the visit more if made at the time he required it; to the palace, therefore, we proceeded, and were soon admitted into the audience chamber, to which we ascended by a long narrow and dark staircase; the apartment might be twenty feet in length, by about fifteen in breadth, with the throne at the furthest end elevated about four or five feet, and with seats opposite to and on each side of it

covered with crimson silk. We waited at least a quarter of an hour before the king arrived; but our impatience was rendered tolerable by the fanning which we received from hand-punkahs, dexterously used even by the lords in waiting, and above all by the antic gestures of one or two women, who appeared to steal a sight of us from a sort of half-enclosed verandah raised immediately behind the throne. They crept out on all fours; appeared timid, yet curious, anxious to see, and yet afraid of being seen. The king himself at last appeared: a man of about forty or forty-five, rather inclining to corpulency, very black, and with very dim weak eyes; his countenance is far from beautiful, yet there is an expression in it which indicates much mildness and benevolence.—His majesty received us most graciously, and said in broken English, and also through the medium of his interpreter, that he was glad to see any of our nation at Joannah. He inquired particularly after King "George!" and as a proof of the love he bore him, we had an entertainment, which consisted of oranges, sweet limes, eggs, tea, milk, cocoanut water, tamarinds, and many more good things, of all of which we were hospitably urged to partake, the king himself saying, "My house is yours, all I have is yours! Ask what you want, you shall then have!" The good man complained of sickness, which the doctor promised to remove by a draught, which was afterwards sent from the ship. The king's son too was also sick, so the doctor proceeded to his residence, leaving me with the sable monarch and his attendants: my faithful—shooting guide, "Cid Abdallah," standing behind me with my favourite "Nock." It appeared to be the etiquette that the meanest person should have access to the room where the king sat, but those nobles who were admitted to a nearer approach, seemed duly to appreciate the honour, and in kneeling attitude received the commands of the sovereign. In the anti-chamber of the king, English muskets were displayed, and on his social board, English china, and even English plate appeared. A book is kept, in which many acts of kindness and humanity, extended to those who had been shipwrecked or cast away on the island, are faithfully recorded, and none more so than one furnished by the Captain of the Admiral Gambier. His majesty was clothed in a light body dress of silk; a loose robe of crimson satin, bordered with gold lace (which his attendants took care to display) hung over his shoulders, and on his head he wore a rude sort of coronet, ornamented with emerald and topaz; on his feet he wore sandals, and by his side hung a large *tulwar*, the hilt of which was adorned with similar ornaments as the crown. The king seemed to value coloured handkerchiefs, and said his ladies esteemed sweet-smelling oils; both of which articles were presented to him. There are no adders on the island; it abounds with the most delicious fruits, which grow spontaneously. The land is very high, one mountain rising above another, like seats in a well-arranged gallery, while the vales are clothed with every thing to please the taste and charm the sight.

The town is a miserable one, and the houses (with the exception of one or two which are built of stone) composed entirely of such "materials" as our Indian villages; there is a fort too, but I rather think its situation only can be boasted of. The inhabitants are all Mahometans, and go to mosque regularly. They are allowed many wives, and are exceedingly jealous of them. Both men and women stain their teeth

yellow with the henna plant, and the toe-nails of many of them are painted red. The idea of a devil or evil spirit is perfectly familiar to them; and from what I could collect, they seem to think him an enormous fish, that pounces upon his prey from the depths of the sea, spouting fire from his nostrils as he approaches his victim. As a place of refreshment for shipping, it is highly to be prized; there are no harbour dues, and provisions may be obtained at nearly the following prices:—A bullock, four dollars; a fine kid, half a dollar; a dozen small but excellent fowls, one dollar: while fruit can be bought for the merest trifle. Two of the Chiefs have visited Calcutta, and seem to retain a grateful recollection of their visit, and of the kindness shown them by our illustrious governor. There is little or no trade carried on at Joannah, their farthest trips by sea being only to Madagascar and Mohilla, from which latter place they procure some cloth and rice in exchange for molasses. Next to the blessings of religion, perhaps no greater blessing could be conferred upon this people than small presents of powder and shot, implements of husbandry, and above all, a proper press for squeezing the sugar-cane, which here flourishes in great beauty.

FROM THE EDINBURGH REVIEW.

An Introduction to Entomology, or Elements of the Natural History of Insects. With Plates. By WILLIAM KIRBY, M. A., &c. &c. and WILLIAM SPENCE, Esq. 2 vols. 8vo. Longman, 1818.

We believe that it requires great enthusiasm to deal accurately with little things; and that it is, consequently, impossible to meet with a reasonable or sober entomologist. We do not mean, therefore, to interfere with the two enormous letters which introduce this work, and certainly do not underrate the value of this branch of Natural History; but we must own, that we are by no means convinced that the study of insects is the very best thing in the world to form the understanding and elevate the mind. That the habit of looking for microscopic differences or analogies among the legs or antennæ of gnats and spiders, will render a person extremely acute in such matters, we have no manner of doubt: but how the quick perception of such differences among resemblances, or the reverse, is to lead to that general intellectual eminence which constitutes an able lawyer, a discerning judge, a great general, a sagacious physician, a painter, an orator, or even an exciseman, we are really at a loss to conjecture. We do not say that such studies will weaken a strong mind, or that a first-rate philosopher may not be a very good entomologist; but we are very sure that such an education as this has prevented many a mind from expanding, and multiplied the class of triflers who, innocently enough, wear out the long disease of life in impaling butterflies, or changing the last heterodox colour in the last feather of a pigeon's wing. It may very well be, that natural history is too much despised in this country: we believe that it is; and we think it fully as laudable a pursuit as running after foxes, or corrupting Cornish boroughs; but Messrs. Kirby and Spence seem to have forgotten that ours is a busy country—except these said fox-hunters, we scarcely know one who is not employed—whereas, in Germany and elsewhere,

if men did not dissect grubs and invent crabbed names, they must hang themselves from pure *ennui*. However, as we do not here mean to write an essay on education, we shall, without further ceremony, proceed in *mediam rem*.

Many of our readers are probably unaware, that, amid all the forms of destruction that surround them on every side, death sometimes lurks among the dainties of the breakfast table. Honey is occasionally poisonous: that it produces uneasiness to particular individuals, most persons know; and that this is not the effect of the sweet itself, but of some foreign poisonous ingredient, we have often ascertained. Thus the honey of the Highlands is often injurious to persons who can use that of Narbonne with impunity; and there is no doubt that, in all cases, it derives this bad quality from particular flowers; possibly, in this country, from that of heath. In some cases, the effects are even fatal. The story of the poisoning of the Greek soldiers in the retreat of the Ten Thousand, is known to every schoolboy; and the effects of the honey, which they had eaten near Trebisond, were extremely violent. The probable cause has been ascertained, by combining a remark of Tournefort with some recent observations of Dr. Bartram. The former observed, that this country is covered with some species of *Rhododendron*; and, in America, it was found, by the latter, that the honey made in the neighbourhood of these plants was unwholesome. But the *Kalmia latifolia* appeared to have produced the most injurious consequences; as many persons died near Philadelphia from eating honey which the bees had procured chiefly from that plant. We ought to add, that the whole of the analogous American plants are suspicious; and that it is therefore imprudent, in this country, to keep hives where there is access to extensive collections of them. These remarks include all the *Rhododendrons*, *Andromedas*, and *Kalmias*, with a few other shrubs too little in fashion in gardens to require notice.

The injuries caused by various insects to those vegetables which are objects of cultivation, comprise a very important branch of the history of these animals; and it is one, indeed, in which the labours of entomologists have really proved useful. By discovering the mode and times of their breeding, hatching, or laying eggs, observers have been enabled to point out the seasons at which it is most easy to destroy them. But their labours have also been of great use in tracing the animal through its transformations, and thus enabling us to determine the destructive parent of an innocent progeny, or the reverse. It may be worth while, for example, for housewives to know, that it is not the moth but the maggot that eats our blankets; and that, if such articles be exposed to light, during the laying season, they may be neglected all the rest of the year.

Many insects, in the state of larvæ, or maggots, destroy wheat, and that in such quantities as to cause serious losses in agriculture, amounting even to many hundred acres in some cases. They insinuate themselves into the young plants below the surface, and devour the centre of the shoot. The parents of these are various beetles (in the popular sense), of the genera *Carabus*, *Harpalus*, *Melolontha*, and others. But, of all these pests, that known by the name of the Hessian fly, in America, is the most formidable, although its systematic name and nature are yet unknown. The ravages of this insect were

first noticed in 1776, and it was supposed to have been brought from Germany by the Hessian troops. Beginning in Long Island, it proceeded inland at the rate of 15 or 20 miles a year, till at last it extended over a space of 200 miles. "Neither mountains nor rivers stopped them;" they "crossed the Delaware like a cloud," and even filled the houses of the inhabitants. Rye, barley, rice,—all other grains, in short, have their appropriate enemies; contending for possession against him who forgets that he himself is the greatest devourer of wheat and barley, rice and maize. But peas and beans, clover, turnips, grass, hops, tea, sugar, vines, apples, pears, and peaches, and what not,—all have their peculiar admirers among the insect tribes.

The account of the ant of Barbadoes, the *Formica saccharivora*, is almost terrific; and we refer to it, because we know the authority to be good. We do not mean by this to insinuate that the word of the respectable authors is not valid. On the contrary, we think their own observations worthy of all confidence. But it is at the same time obvious, that they are somewhat too trusting—may we use the word credulous?—with respect to many of their quotations from others. Perhaps this is an unavoidable effect of entomology, instead of that "suspension of judgment" which we were promised from this study. But, indeed, if we admit all that Huber, Kirby and Spence, have told us about bees and ants (an article on which will be found in one of our past numbers), and there seems no reason to withhold our assent, it is not very easy to say what we are not to believe respecting this most extraordinary part of creation. The ant in question appeared, it seems, "about seventy years ago in such infinite hosts in the island of Granada," as to put a stop to the cultivation of the sugar-cane. "A reward of 20,000*l.* was offered to any one who should discover an effectual mode of destroying them. Their numbers were incredible: they descended from the hills like torrents; and the plantations, as well as every path and road for miles, were filled with them." Rats, mice, reptiles, birds, and even some of the domestic quadrupeds, were killed by them. "Streams of water opposed only a temporary obstacle to their progress; the foremost rushing blindly on to a certain death, and fresh armies continually following, till a bank was formed of the carcasses of those that were drowned, sufficient to dam up the waters, and allow the main body to pass over in safety below." They even rushed into the fires that were lighted to stop them. This pest was at length exterminated by a hurricane.

Of all the descriptions of armies of locusts that we have read, nothing comes near to that of Major Moore, the well known author of the Hindoo Pantheon. When at Poonah, "he was witness to an immense army," of these animals, "which ravaged the Mahratta country, and was supposed to have come from Arabia."—"The column which they composed, extended," (as Major Moore was informed) "five hundred miles; and so compact was it, when on the wing, that, like an eclipse, it completely hid the sun, so that no shadow was cast by any object; and some lofty tombs, distant from his residence not two hundred yards, were rendered quite invisible." Hasselquist tells us, that the Pacha of Tripoli once raised an army of 4000 men, to fight the locusts that had invaded his dominions. Queen Christina,

on the same principle, had a train of artillery in her study to war against the fleas. Of such enemies as these, it may fairly be said that their strength is in their weakness. Man, with all his machinery and his strategy, is not a match for these myriads of insignificant looking creatures that assail him in all quarters; in his liver, his stomach, his skin, his house, his books, his food, his pleasures, and his repose. There is scarcely one of them all that might not drive him out of creation, were there no remedies provided against the consequences of that fertility with which they are so conspicuously gifted. The termes, or white ant of the East and West Indies, is the most dexterous, at least in the art of demolishing the wood of houses, and other matters of a solid nature. In a few nights they will destroy all the timber work of a large apartment, leaving nothing but the external coats of the wood, which, in the end, they also demolish. These operations are carried on by a regular system of mining. Kœmpfer, an author worthy of all credit, relates that, during one night, the termites entered from the floor into one of the legs of his table; traversing the board in the same manner by a concealed passage as big as his finger, and returning down through the opposite leg into the floor below. They have even attacked and destroyed ships.

Fortunately for our impotent species, many of our great enemies make war on each other, or find, in their own department of creation, their most natural enemies; and thus, if we find among them foes, we also have allies. It is a case, however, in which it is particularly necessary not to commit the common mistake, of not knowing our friends from our enemies. The idle boy, or blundering gardener, imagines that he has gained a great victory when he has destroyed a dragon-fly, or a few wasps; when, for each of the former, there are turned loose on him many thousands of plagues which these animals, the tigers of their division, were created to destroy; and when, for every one wasp, his peaches must submit to the depredations of an hundred flies. It is the business of ichneumons to keep caterpillars within bounds; the lady-bird protects our roses from the green aphid; the vinaigrier of France is the Napoleon of Cockchafers; the cicindela, worthy of being classed with the dragons of romance, make war on every insect; and, lastly, comes the formica omnivora, to swallow them all. Thus we have to choose very often between spiders and flies; and Betty's broom sometimes proves an enemy instead of a friend.

It has been said, that man is the only animal that makes war on his own species. But the insects, who outdo us in so many things, vie with us in that species of policy too. The mantes have their fore-legs somewhat in the shape of a sabre; so that they can cut off their antagonist's head, or cleave him down the middle, as dexterously as ever did Serjeant Shaw. We do not know if Röscl intended to be satirical when he asserted that he could never succeed in rearing the *Mantes religiosa*, as the stronger always devoured the weaker. The Chinese children treat these animals like game-cocks; keeping them in cages for fighting. The scorpions seem peculiarly gifted with this human propensity. Monsieur Maupertuis placed an hundred in one box; and the event was, that they "all destroyed each other." Like the rats in the story, we suppose nothing remained but one tail. Spiders fight together till they have no legs left:

and some caterpillars are professed cannibals; feeding on each other, as St. Jerome tells us our ancestors, the Dalriads of Mr. Pinkerton, did in old times.

The care which insects take in depositing their eggs, and the provision, which they lay up in many cases for the larvæ, are universally known. It is not common with them, however, to pay much personal attention to the eggs when once laid, nor to have any communication with their young. But the earwig, a much "traduced" and motherly animal, say our authors, sits on its eggs, and if they are forcibly dispersed, will collect them again. The young ones, when "hatched, creep like a brood of chickens under the belly of their gentle mamma, who very quietly suffers them to push between her feet, and will often, as De Goer found, sit on them in this posture for some hours." A certain field bug, the *Cimex griscus*, "conducts her family of thirty or forty young ones as a hen does her chickens. She never leaves them; and as soon as she begins to move, all the little ones closely follow, and whenever she stops, assemble in a cluster round her." A branch of a tree thus peopled having been cut off, "the mother showed every symptom of excessive uneasiness. In other circumstances, such an alarm would have caused her immediate flight; but now she never stirred from her young, but kept beating her wings incessantly with a very rapid motion, evidently for the purpose of protecting them from the apprehended danger." Thus also spiders carry out about their nest or egg bag, which they protect with the greatest care; and even after they are hatched, the young ones are carried about on the mother's back. The care which bees and ants show for their eggs and their young, are so generally known as to require no notice.

In the article of food, there are some curious differences among the tribes of insects, as much in the manner as in the matter and quantity. Caterpillars will consume more than twice their own weight of leaves in a day. Some larvæ that live on flesh will, in the course of a day, grow to be two hundred times heavier; others again are extremely abstinent. A mite will live three months, or more, although glued down to a piece of glass. Spiders will live a year without food. M. Baker kept a beetle, the *Blaps mortisaga*, three years in the same manner. As to the matter, they seem to eat every thing but metals and stones. Every part of every plant, fruit, leaves, bark, wood, secretions, is the prey of some insect or other. In animals, they live within and without; not easily induced to quit, and eating every thing to which they can gain access—they perforate our blood-vessels, and suck our blood. Myriads feed by destroying each other: and to numerous larvæ and others is delegated the important task of destroying and removing dead animal matter. A very jovial fly, the *Oinopota cellaris*, lives entirely on wine and beer; and the bookworm, "beast of prey," literary in his pursuits, together with numerous tinæ and termites, regale on our manuscripts and books, destroying, in South America, all titles, genealogies, laws, records, and cases;—whence probably it is, that we know nothing of the colony of Madoc and the chronology of the Mexicans. In short, nothing will stand but monumental brass, which, unluckily too, time and the rains and heats reduce to dust and verdegriis, as the others do the hortus siccus of the botanist, and the treasures of the entomologist.

The manner of eating is infinitely varied in this tribe, as much in consequence of their great variety of forms and of food, as of the different

conditions in which the individual exists at different times. The forms of their jaws are endless, and many of them possess two pairs, the one intended for securing, and the other for masticating, their food. Those that feed on honey have a tubular proboscis, varying in its form, disposition, length, and other particulars, according to the various objects with which it is to be engaged. The fluids are extracted from the solid parts of plants or animals, by other instruments, consisting of lancets or cutting tools, acting within a tubular or grooved beak. The proboscis of many flies has an apparatus at the extremity for forming a vacuum, thus aiding the ascent of the fluids. Some of these instruments are so sharp as to pierce the hard wing of a beetle. With respect to the sanguivorous species, our authors have forgot to remark, that they not only select the arteries for their operations, but also have the power, by means of some poisonous fluid, or chemical action probably, so to dilute the blood, as to make it flow through orifices which it otherwise could not pass. Equally extraordinary must be the animal compound which forms these perforating engines, which also they have passed unnoticed. Our midge is so minute an animal, that its proboscis cannot be seen without a high magnifying power. Yet it penetrates a tough epidermis and an artery also; and that with an engine that is flexible, is probably muscular, and which, for aught we can conjecture, cannot differ from the toughest animal matter we know, namely, horn or bone; whereas, we cannot cause even the toughest or hardest metals to produce these effects, when of a far greater size; nay, it is with some difficulty that we can reduce even the most tenacious to such dimensions.

We do not find much of novelty in the account of the stratagems used by insects to ensnare their prey; and we shall therefore add one that fell under our observation. The cancer phalangium, L. is provided with very long legs, and is entirely covered with glutinous hairs. By means of its cutting hands, it snips off the leaves of the small fuci in the pools which it inhabits, and, by attaching them to these hairs, becomes undistinguishable from the plant itself. Thus dressed, it lies on its back with its claws extended upwards, making immediate prize of the small shrimps or other insects, that fly to the kalu plant for shelter. So perfect is the deception, that we only discovered this trick, by finding that a plant which we had placed in our book, with the intention of drying it, turned round and ran away. We had the curiosity afterwards to examine the metamorphosed animals in their own element, when we found that nothing could induce them to show any marks of life but the entrance of a shrimp among their leaves. When stripped of their borrowed plumes, they escaped with great rapidity.

With respect to the construction of their habitations, the bee tribe, as is well known, is the most remarkable. One species, the *Apis muraria*, builds with stone. The materials are sand, which is first cemented by some viscid fluid which the creature supplies, into the form of small shot, and then transported to the wall which is chosen for the nest. With these, ranges of cells are constructed for the reception of eggs, and of the food of the future larvæ. The cells, when completed, are entirely covered with the same material, so as to conceal the whole; which thus becomes scarcely distinguishable from the stone to which it is fixed. The common wasp makes its nest of perfect paper; and, by some species, trees are excavated into cells as complicated as those of the common bee, entering by apertures scarcely visible. We have seen in Scotland a large larch tree, of which a foot in length of the

trunk was thus manufactured, while living, into a beehive. The *apis papaveris* makes a cell in the ground, which she chooses to line with the scarlet petals of the poppy, and that alone. The leaves of trees, ingeniously cut, cemented and adapted, form the materials of cells or houses to many other insects of this family.

Among the habitations of other tribes of insects, few are more remarkable than the several galls, one of which furnishes us with a material for ink. The mere perforation formed by the insect for its egg, is sufficient so to alter the whole vegetable actions, as to generate a deformity which, for each insect, is invariable. Among these, the red hairy excrescence of the rose, formed by a cynips, is well known. From similar causes, some leaves are rolled up into cylinders, others swell so as to form cells, or else they produce tubercles and bladders of various kinds, in which the egg finds a protection, and the larva its food. Some insects excavate galleries in the substance of a leaf, leaving the external skins untouched; and those which eat our fiddles and our floors, finding board and lodging at the same time, are far too well known. The anobia of Fabricius is our chief domestic pest of this tribe. Certain worms in New Holland, larvæ of a *nyctorobius*, shut up the holes which they bore in the trees with pendulous trap-doors, made of leaves interwoven with their own silk; and thus protect themselves from their enemies. The larvæ of two genera, *Tortrix* and *Tinea*, roll up leaves for themselves by means of silk-threads, which are carried from one side to another and shortened, till the effect is produced. Can this larva really reason so well, as to gnaw through some nerve of the leaf, should any one, stronger than the rest, offer a resistance? Something must occasionally be allowed to the imagination of entomologists: the business of larvæ is simple—little else than to eat. In the winged insect, whose pursuits are far more complicated, and whose superior organization bespeaks the presence of a higher order of mental powers, such things are often as credible as they are unquestionable. Some of the aquatic insects clothe themselves in cases of agglutinated sand and stones; and one uses living shell-fish for the same purpose,—"a covering as singular," say the authors, "as if a savage, instead of clothing himself in squirrels' skins, should sew the animals themselves into a coat." But this is an endless subject.

Our authors are very eloquent on the "celestial dances" of gnats: the "chironomi alternately rising and falling, appeared, in the full beam, so transparent and glorious, that they scarcely resembled any thing material—they reminded us of angels and glorified spirits drinking life and joy in the effulgence of the Divine favour!" This, and such like, is very Harveian,—or more. The emigrating associations of insects, or the temporary societies which they form, are often remarkable. Many flies and beetles travel in clouds or columns; often from the land to the sea, as if for the sole purpose of being destroyed. We remember an open column, of a small collopterous insect, about five feet in diameter, which was flying for a whole day in a straight line past John-o-Groat's House, and with considerable velocity; how much longer, our entomological patience was not sufficient to allow us to discover. In the same manner aphedis migrate in clouds, so as to fall in showers, and cover the ground. Such visitations are commonly called blights—a term of wide meaning. A small dragon-fly was observed some years ago to land from the sea, in Suffolk, in such abundance as to

throw a shadow on the water of many acres in extent. The yellow cabbage-butterfly has been observed thus to migrate in clouds, as have many kinds of cimex, cicadi, coccus, and others; and, in all these cases, such associations are, like those of swallows, formed among animals that do not live in societies, like the bee and ant, but which thus unite for some unknown purpose.

We shall pass over all that part of the present volumes which relates to the societies of Bees and Ants, as our former remarks on Huber's works, from which they are principally taken, render any further notice unnecessary. Among the means of defence from their enemies, the talent of imitating inanimate objects, or of confounding themselves with their places of residence, are often remarkable. Like some birds, quadrupeds, and fishes, many insects are of the colour of the ground in which they dwell. The *Curculio nebulosus* is undistinguishable, from the mixed black and white soil which it inhabits, as is the *Brachyrhinus niveus* from its native chalk. A vast number resemble the leaves and flowers on which they reside. Some of the genus *Phasma* so much resemble twigs, as well in their colour as in their strange shapes, that even an expert entomologist does not easily observe them. The imitation of dead leaves is very common, as in many of the genera *Mantis* and *Phasma*; as is that of living ones in some locusts, in the noctua *ligustris* and others. Some insects, on the other hand, find their defence in their threatening aspect; while a great number possess very serious means of resistance in the variety of their spines, horns, bristles, scales, stings, or poisonous exudations. Caterpillars that have hairs often roll themselves up; so that, becoming an entire ball, like hedgehogs, they are defended all round. The common wood-louse applies his scaly back to the same purpose; and so steady are most of these animals in their resistance, that they will sometimes not give way while they have life. Whether our blistering fly is intended for poison or spice to its enemies, entomologists are not yet agreed. Our authors think that the light of some luminous insects may serve for a defence. We are more inclined to side with the nightingale in the fable.

The vitality of some insects is a very provoking circumstance to us miserable mortals who die when the brains are out—and long before. The females of moths and butterflies will not die upon any provocation, till they have laid their eggs. There are fifty, and fifty more, that will go on living and performing all their usual functions without wings, or legs, or heads, or intestines. They are as comfortable when impaled on a pin, and stuck into a pill-box, as in their native element. At least they make love, and eat each other; and what more is wanted to prove that they are happy? Some mites will live in alcohol (*Acarus vegetans*); so do the coccinellæ. Dr. Franklin brought flies from America in a pipe of Madeira, and revived them in London. Caterpillars may be frozen to the hardness of a stone, and yet revive. We know not why all these creatures should not be immortal. Many resist drowning for a long time; but Dr. Reeve found living larvæ in a hot spring in the Valais, the temperature of which was 208; and we have Lord Bute's authority, that, in the boiling springs of Albano, there were not only conservæ living, but "black beetles, which died on being taken out and plunged into cold water."

The motions of insects, and the innumerable ways in which they

attain their ends, form a wide subject. We have room for but little. The activity of the cheese-maggot in jumping is well known. This motion is produced by bending itself, and inserting two claws which it possesses at one end, into as many cavities adapted to them at the other. From this position it suddenly disengages itself, by extending the body, and then makes leaps as extraordinary in proportion to its length, as if a man was to jump 160 feet high.

The modes of swimming are numerous in this tribe. Like fishes, some swim by means of their tails, or fins, or both. Some use their wings for that purpose. The *stratyomis* chamæleon carries with it below the water a bubble of air, included in some fibres of its tail, which it uses as a float, in the same manner as fishes use their air-bladder. There are species that swim by the recoil of water which they eject; the same contrivance by which the genus *Salpa*, among the marine worms, moves. Some walk, or fly, or jump, on the surface of water, just as if it was land, as is the case with the water-bug and water-spider; while others again walk on the land below, as if there was no water around them. The organs intended for walking are endless, in variety of structure as of number. Even the caterpillars are provided with them. That of the *Bombyx leporina* is extremely rapid in its movements, as are some others. Many, on the contrary, are very sluggish. The caterpillar of *noctua pedata* jumps from one leaf to another. Others travel by means of a web of silk, which they continue to spin as they proceed; and thus they are enabled to hold fast by smooth surfaces. The common fly effects the same purpose by means of a hollow muscle in the foot, which it contracts so as to form a vacuum, just as the limpet adheres to rocks. Among the running insects, the velocity is sometimes so great, that it is scarcely possible to imagine that they are not rather flying than using their legs. Mr. Delisle mentions a fly so small as scarcely to be visible, that ran six inches in a second; which, comparing its velocity to the size of its body, is an incredible degree of swiftness. The rapidity of the red mite of strawberries must have been remarked by every one. It appears to glide rather than run, and almost seems in two places at once. Some of the marine insects that infest fishes (*monoculi*) jump with such force, that, although an inch long, their passage through the air is invisible. This is done by the tail. The common spring-tails (*Poduræ*), so familiar on our sea-shores, use the same engine for their leaps. Fleas leap by means of their hind-legs, as do grasshoppers, and a great number of ideopterous insects, — *sagra*, *haltica*, &c. The *machilis polypoda* has eight pair of springs under the belly, intended solely for this purpose; and some beetles have similar contrivances on the breast, to enable them to rise when they have fallen on their backs.

The flying of certain spiders by means of their webs, is not the least extraordinary mode of motion possessed by insects; nor, in truth, is it very intelligible, although the fact itself is unquestionable. In ordinary cases, the spiders spin their threads slowly from organs adapted to that end, perforated with numerous holes; so that each thread may consist of many thousand filaments. The flying spiders, on the contrary, can dart out the thread in a straight line, for many inches, in any direction; and then, in some unknown manner, they follow it. In these cases, where the animal and his chariot are wafted away to-

gether by the winds, there is no difficulty. Our authors have thrown no additional light on this difficult subject.

On the subject of the sounds emitted by winged insects, our authors have committed some oversights. It is remarked, that the gnat emits no sound till the thirst for blood seizes it. The cause is obvious. In early spring, its flight is feeble; and the vibrations of the wings, which are the true causes of all these sounds, are not sufficiently rapid to produce an audible note. It is too low in the scale to be heard, for so small a weight of vibrating matter. When the flight is rendered more rapid by the stimulus of hunger, or heat, the vibrations become so numerous, as to produce tones high in the scale, and readily heard.

The luminous properties of many insects form a notable part of their economy. The glow-worm and the fire-flies of Italy and the West Indies, are known to every one—at least by reputation. In the glow-worm, there is a receptacle of the luminous matter near the tail. The elater noctilucus carries its light in four places; two in the thorax, and two under the wings. Hence this creature is most brilliant when flying. The light is so bright as to serve, when very near, to read the smallest print. In St. Domingo, it is said, they were formerly used by the natives as candles, as they are in many places for nocturnal ornaments. There is a pleasant story here related, which the authors, however, seem to doubt themselves, of Sir R. Dudley and Sir T. Cavendish having been terrified by these lights, which they mistook for those of a detachment of Spaniards, as the land crabs—from the noise of their march—were, on another occasion, mistaken for a body of cavalry. Our authors think that this property is more widely diffused among insects than is commonly imagined; and, among others hitherto unsuspected, he mentions the mole-cricket. On the uses of this provision, they are very brief, and we need not follow them.

But they have entirely overlooked a large class of insects in which, as far as we can trust our own observations, this property is almost universal. We except of course the larger marine insects with hard shells, such as the crabs, and confine ourselves rather to the minuter and softer species that reside in the sea. The marine insects share this property with the marine worms, and even with the fishes; so that, as far as general considerations are concerned, we need not, and cannot well separate them. In the examination of many hundred species of marine animals of all kinds, we have found no exception to this rule, and may therefore fairly consider it as universal. In some it is diffused over the whole surface; in others, as in the medusæ, beroes, and holothurias among the worms, and the squillæ and cyclopes among the insects, it resides in a single spot. The colour of the light varies in different animals; we have seen it red, yellowish, violet, and pale, resembling moonlight. It is evident, that, in many, it is under the command of the will, as in some of the land insects. Irritation of any kind, such as the friction of a line or agitation of the water, excites it readily; but if the animals are confined in a limited quantity of water, they soon become tired of showing their powers; and, after one or two sparks, cease to give light until roused again at some distant time.

In the land insects, a yellowish fluid has been observed to be the

seat of the light; but its nature and situation have not been discovered in any of the marine ones; except inasmuch as, in some of the fishes, it is entangled in the mucous secretion of the skin. In this case it is diffusible in water, without immediately losing its properties. When it is excited by friction, it has been supposed to be in consequence of that diffusion. But it cannot thus be produced in a dead animal. It is probable, therefore, that it is a living action; and this is confirmed by the fact, that if a shoal of herrings is alarmed by any noise, the whole instantly becomes luminous.

This is the light then which produces the luminous appearance of the sea,—a phenomenon often splendid, and sometimes terrific, on which so much has been written to so little purpose. Sea-water is never luminous, except when it contains animals of some kind; and, wherever the lights are large and brilliant, it is very easy to ascertain the animals from which it proceeds. But it is often luminous, it is said, when no animals are present. This is a remark founded on carelessness; as it is scarcely possible, particularly near sea-coasts, where the luminous appearance chiefly prevails, to find a cubic foot of water that is not crowded with worms and insects, many of them invisible to the naked eye. It is these minute creatures that produce the more general diffuse light, and which, in particular, cause that continuous line of it which attends the descent of a fishing line.

The last subject treated by our authors, is the thorny question of instinct. With the metaphysics of spiders and scorpions, we cannot interfere; nor do we mean to decide between the philosophers who consider the actions of insects as the result of a *plastic nature*, or of a species of machinery, or of certain pre-established harmonies between certain geometrical figures impressed on their brains, and the actions which they perform. That cell, says Buffon, which one bee would make round, becomes hexagonal by the mutual collision of seven; and so on. But if we were allowed to judge in so delicate a case, we should be inclined to question whether the insects had not often more sense than the insectologists. But to give the *coup de grace* to these metaphysical disputes at once, we must adopt Mr. Steffen's theory, and declare our belief, that the instincts of insects are merely the "shootings out of inorganic animal masses." If that will not explain the matter, we know not what will.

We shall content ourselves here with enumerating a few of the most remarkable things done by insects, as there is a vast deal relating to the ordinary business of their lives, which is neither very much varied nor very interesting. The important thing is to show that they do not proceed by a blind impulse, but accommodate themselves to varying circumstances.

The scarabeus vernalis lays its eggs in small balls of dung, which it rolls up for that purpose; but if it meets with a sheep-pasture, it is wise enough to adopt what it finds ready made. The caterpillar of the common yellow butterfly fastens itself to a wall by means of a silk thread, which, to ensure its adhesion, is attached to a flat preparatory web laid on the stone. But upon being furnished with a piece of muslin, instead of the latter, it fastened the thread without any previous preparation. Thus, many other insects, if deprived of the substances which they commonly use for their nests, will find substitutes in something else. On a similar principle of accommodation,

many of them alter their plans if disconcerted by an accident; varying them in such a manner as to meet the exigencies of the new case. The end of a cylindrical cell, constructed for the head of a caterpillar, having been cut off, and there being no room to replace it properly, the animal changed its place and adapted it to receive the tail; making a new head-piece at the other end. In the beautiful geometrical web of the garden-spider, many guys are required to keep it tense, and to prevent it from being blown away by the wind. These, however, cannot be fixed by any invariable rule, as they depend on the forms and distances of the various supports. Moreover, it is easy to see that they are distributed always according to the necessities of the case. If the position of a branch is altered, or a support taken away, a new guy is carried out to some convenient part; and, when it comes to blow, the spider may be seen strengthening his standing rigging, exactly at the places where his building is in want of most support. Dr. Darwin remarked that a wasp, which he watched, attempted to carry away a large fly which it had caught; when, after various attempts, in which the wind, by acting on the dead animal's wings, had impeded its flight, it alighted on the ground with its prize, snipped off the wings, and then bore away the carcase with ease. The same has been observed in the case of other insects, compelled, after several trials, to the necessity of biting away one part after another, till they had reduced their prey to a size capable of entering their holes. In bees and ants, the resources of this nature are endless; but some of them were formerly noticed in our remarks on Huber's work; and we have now no space to dwell much longer on this subject.

That insects have the power of communicating their ideas, or intentions and wishes to each other, seems fully ascertained; not only by the very pointed experiments of Huber, but by many other observers. A single ant is known to communicate its discovery of a piece of prey to its fraternity; and, in the same way, both these and other insects, when unable to execute some particular thing alone, are known to go and fetch assistance. According to Huber, the antennæ are the organs of communication, and the intelligence is conveyed by particular modes of contact.

But we must draw our remarks to a close, and take leave of these two dense volumes, which, if we understand aright, are to be followed by two more, containing the classification and nomenclature. With respect to the part that we have gone through, it appears most unnecessarily tedious and incumbered. There is a sort of flourish of trumpets before each new actor appears on the stage, which occupies time and space that might have been much better employed. Why two authors, of deep reading, and fully masters of their subject, should have adopted the style and manner of common school-books and stories for good boys, we cannot see; as we presume they did not write for children. Paley is rather dry and aphoristic, we admit—and now and then too logical and priggish; but he comes to the point, and tells his story in a few words. It is quite easy for Messrs. Kirby and Spence to take the happy medium; and as there is no want of matter, they can surely be under no necessity of seeking relief in words. If a single idea must be spun out into a quarto, we admit the convenience of such proceedings; but the race of insects is

a busy one: there are deeds in abundance to record; and we therefore think, with ancient Pistol, that it would be best done with "*pocos palabras*."

FROM THE MONTHLY MAGAZINE.

Carriages to be propelled by Steam on Common Roads, and capable of conveying Goods and Passengers.

The ingenuity of man has already effected so many important improvements, and the successful application of mechanical power has so advantageously contributed to the general good of society, that, to excite or deserve attention, something of unusual excellence must now be presented to public observation.

It has been frequently remarked, that one of the proudest triumphs of mechanics, would be the construction of machines adapted to the transport of goods, without the necessity of animal labour, and various efforts have been made to accomplish this object.

Until the present moment, however, those carriages which have depended upon mechanism, or upon mechanism and manual labour united, like Drax's velocipede, or Birch's bivector, have sustained but a short-lived place in the admiration of their supporters; and those which have been propelled by steam, as Mr. Blenkinsop's near Leeds, and others, have been confined to rail-ways, where, by indented wheels, or contrivances of a similar kind, sufficient resistance has been obtained to ensure the progress of certain loads in straight directions.

It seems to have remained for Mr. Griffith to introduce to the scientific and the commercial world, carriages which can be propelled by steam upon common roads, and employed for the common purposes of conveyance.

It is owing to his steady and patient perseverance, during several years, that this long solicited result promises soon to become a public benefit, and that the many important advantages, branching into an almost infinity of directions, will be secured to the United Kingdom.

Under the immediate inspection of Mr. Griffith, and according to his plans, with the assistance of Mr. Francis Bramah's unremitting attention, a carriage has been completed at the Pimlico manufactory. It is twenty-seven feet in length, including seven feet for the fire, boiler, cylinders, and the mechanism connected with the driving-wheels.

Instead of an axle-tree passing through both the front or both the hind-wheels, as is usual in other carriages, the axis merely passes through the nave of each wheel sufficiently to support on each side uprights, which strengthen and connect the frame of the wagon. From the hind part of this frame, or bed, proceed two perches, inclining inwards until they meet: and, being joined a few feet before they reach the front wheels, they form the bed of a revolving perch; this revolving perch is connected with the bed of the fore part of the carriage, or front wheels, and by its rotatory motion, when either of the wheels is more elevated or depressed than the other, preserves the horizontal position of the carriage.

The direction of the carriage is effected by the action of a bevel pinion connected with a spindle, which is governed by the coachman; this pinion acts on a wheel, whose movements compel those of certain iron braces fixed to the exterior of the front wheels, which turn upon the same spot where they touch the ground; so much power is gained by this pinion, that little force is required from the coachman to produce the necessary direction.

Amongst a variety of new modifications of means already known, and which show that the utmost attention has been bestowed upon the present combination of mechanical and physical powers, the following may deserve to be particularised as peculiar to Mr. Griffith's steam-carriage.

1st. The easy method of generating steam without danger of explosion; and, after condensation, reproducing a considerable part of it for further use.

This is effected according to Mr. Griffith's invention by furnishing a given superficies of heated metal tubes, with such a quantity only of water as may be converted into steam, in an exact proportion (both as to quantity and time,) with the expenditure of the previous supply. Instead, therefore, of an immense volume of water, from which steam might be generated, as in common boilers, an assemblage of tubes (whose diameters vary from $1\frac{1}{2}$ to 3 inches) is scientifically connected together, the lower range of which is supplied with the requisite quantity of water by injecting pumps connected with a reservoir destined to serve for at least eight hours, and placed before the mechanism, between the perches. The steam, generated through the extended cavity of these tubes, is conveyed into two cylinders, the pistons of which are connected with beams and connecting rods. To the lower ends of the latter are attached the cranks, which cranks are again connected by means of a novel modification of an universal joint to the driving-wheels, firmly fixed to the interior part of the carriage common-wheels, and these last are thus propelled as required.

2ndly. The Artzberger connecting the crank with the driving-wheels.

This very ingenious contrivance is the invention of Mr. John Artzberger, professor of mechanics in the Imperial Polytechnic Institute of Vienna, and has been so named by Mr. Griffith in honour of his friend.

It is the play of these united pieces, added to the balancing movement allowed by the suspension of the whole, that prevents injury to the mechanism from any shock to which the carriage may be subjected; it is also the Artzberger which permits one hind wheel to make (as in turning) a larger segment of a circle than the other, and effects without difficulty the retrograde movement of the carriage; objects of sufficient importance to authorize the denomination by which Mr. Griffith, in his honest acknowledgment of the inventor, has thought proper to distinguish it.

The velocity with which the carriage may be made to move, depends upon the quantity of steam conducted into the cylinders, above and below the pistons, whose alternate movements prevent the necessity of a fly-wheel, as in other steam-engines: and the quantity of steam is regulated with the utmost facility, by means of a regulating cock, controlled by the person who directs the engine.

When power is required, and velocity can be dispensed with, as in going up-hill; a pinion, of five inches diameter, is inserted into the teeth of a driving-wheel, whose diameter is twenty-five inches; the strokes of the pistons being calculated at sixty per minute, and the rotation of the driving-wheel being effected by five strokes of the piston, the carriage-wheel, whose circumference is fifteen feet, making one-fifth of its revolution in the same time, the carriage will therefore proceed up-hill at the rate of rather more than two miles per hour.

Where power may be dispensed with, and velocity increased, as on level roads, a wheel of ten inches diameter is made to work in a driving-wheel, whose diameter is twenty inches, the number of strokes of the pistons being the same, it is evident that thirty revolutions of the carriage-wheel will take place, and that the progress of the carriage, upon tolerably even roads, will be $5\frac{3}{10}$ miles per hour, viz. $60 \times \frac{10}{20} = 30 \times 15.7$ the circumference of the carriage-wheel = 471 feet per minute = 28260 feet per hour, or 9420 yards = $5\frac{3}{10}$ miles per hour.

The simplicity with which these wheels are put in and out of gear is admirable, and can be effected almost instantaneously.

3dly. The mode of stopping the carriage in cases of descent, or danger, independently of doing so by preventing the supply of steam.

This object is of the utmost importance, where, from the impetus given to the carriage going down hill, its motion may continue dangerously accelerated, even though the propelling power of the steam-engine may be withheld; and it is provided for by an admirable modification of a machine, known in Germany by the name of *premsse*, answering, in some respects, to the English technical term, a break, by a mechanical pressure being made upon the front part of the felly, or rim, of the hind wheels, their motion may be simultaneously, or, to prevent any injury from a too violent shock, may be gradually arrested.

4thly. The suspension of the whole apparatus, so that the operations of the steam-engine and mechanism may not be impeded or subject to derangement whilst travelling.

This is one of the most essential improvements in locomotive machines, and promises all the advantages that may be expected from its present application. The steam-engine, and those parts of the mechanism of which the exposition to shocks might endanger the progress of the carriage, are suspended by means of four chain slings, with helical springs within them, whose motion is such as to ensure security.

5thly. The revolving perch.

To prevent the horizontal position of the carriage from being deranged, Mr. Griffith employs, as has been already mentioned, a revolving perch, peculiarly adapted to the bed or frame of the front wheels, and whose movement amply ensures the safety required.

In addition to every other kind of security that the most profound reflection has enabled Mr. Griffith to adopt, there are two safety-valves calculated at fifty pounds upon a square inch, whilst every part of the steam apparatus has been proved at the rate of 200 pounds upon a square inch.

From these safety-valves, as well as from the cylinders, the steam is conducted into two condensers, formed of flat copper tubes; that part of the steam which is condensed, falling to the bottom of the condenser, is conveyed to the reservoir of water for further use, whilst

the uncondensed steam is conducted through the chimney, and here extinguishes such sparks as may occasionally find their way from the charcoal, combined with coke, of which the fire is made.

The fire, placed under the boiler, is surrounded by iron plates, and so far removed from the part of the carriage destined for goods, that no possible danger can be apprehended.

The weight of the carriage (which is in form of a caravan,) and the whole apparatus, may be calculated at $1\frac{1}{2}$ ton: it is destined to carry three tons of merchandise, making a total of four tons and a half, upon wheels conformable to the regulations established by law, and subject to the usual restrictions.

We understand that, actuated sincerely by a disposition to promote the public welfare, it is Mr. Griffith's intention to reduce the prices now paid for the carriage of goods throughout the country; not that he can flatter himself with the hope of being speedily useful on many roads, since the construction of a number of wagons demands not only extent of funds, but also considerable time. Should it be proved, however, that Mr. Griffith's steam-carriages can convey goods in an equally secure manner with other wagons, at the rate of five miles per hour, or 100 miles per day of twenty travelling hours; and, at a freight, twenty-five per cent. cheaper than the present prices, there can be no question that he will have deserved well of his country and of mankind.

FROM THE LONDON MUSEUM.

THE UNCALLED AVENGER.

An authentic Anecdote, related by M. Oldecop, of St. Petersburg.

The return of the victorious Russian army which had conquered Finland under the command of General Buxhövdén was attended with a circumstance which, it is true, has at all times been usual in the train of large armies, but which naturally took place to a much greater extent in these high northern latitudes, where the hand of man has so imperfectly subdued the original savageness of the soil. Whole droves of famished bears and wolves followed the troops on their return to the south, to feed on the chance prey afforded by the carcasses of the artillery and baggage horses that dropped on the road. In consequence of this, the province of Esthonia, to which several regiments directed their march, was so overrun with these animals, as greatly to endanger the safety of travellers. Hence, in a single circle of the government, no less than forty persons of different ages were enumerated, who had been devoured during the winter by these ravenous beasts. It became hazardous to venture alone and unarmed into the uninhabited parts of the country; nevertheless an Esthonian countrywoman boldly undertook a journey to a distant relation, not only without any male companion, but with three children, the youngest of which was still at the breast. A light sledge, drawn by one horse, received the little party; the way was narrow, but well beaten, the snow on each side deep and impassable, and to turn back, without danger of sticking fast, not to be thought of.

The first half of the journey was passed without accident. The

road now ran along the skirts of a pine forest, when the traveller suddenly perceived a suspicious noise behind her. Casting back a look of alarm, she saw a troop of wolves trotting along the road, the number of which her fears hindered her from estimating. To escape by flight is her first thought; and with unsparing whip she urges into a gallop the horse, which itself snuffs the danger. Soon a couple of the strongest and most hungry of the beasts appear at her side, and seem disposed to stop the way. Though their intention seems to be only to attack the horse, yet the safety both of the mother and of the children depends on the preservation of the animal. The danger raises its value; it seems entitled to claim for its preservation an extraordinary sacrifice. As the mariner throws overboard his richest treasures to appease the raging waves, so here has necessity reached a height at which the emotions of the heart are dumb before the dark commands of instinct; the latter alone suffers the unhappy woman to act in this distress. She seizes her second child, whose bodily infirmities have often made it an object of anxious care, whose cry even now offends her ear, and threatens to whet the appetite of the blood-thirsty monsters—she seizes it with an involuntary motion, and before the mother is conscious of what she is doing, it is cast out and—enough of the horrid tale! The last cry of the victim still sounded in her ear, when she discovered that the troop, which had remained some minutes behind, again closely pressed on the sledge. The anguish of her soul increases, for again the murder-breathing forms are at her side. Pressing the infant to her heaving bosom, she casts a look on her boy, four years old, who crowds closer and closer to her knee: “But, dear mother, I am good, am not I? You will not throw me into the snow, like the bawler?”—“And yet! and yet!” cried the wretched woman, in the wild tumult of despair—“Thou art good, but God is merciful!—Away!” The dreadful deed was done. To escape the furies that raged within her, the woman exerted herself, with powerless lash, to accelerate the gallop of the exhausted horse. With the thick and gloomy forest before and behind her, and the nearer and nearer tramping of her ravenous pursuers, she almost sinks under her anguish; only the recollection of the infant that she holds in her arms—only the desire to save it, occupies her heart, and with difficulty enables it to bear up. She did not venture to look behind her. All at once, two rough paws are laid on her shoulders, and the wide-open bloody jaws of an enormous wolf hung over her head. It is the most ravenous beast of the troop, which having partly missed its leap at the sledge, is dragged along with it, in vain seeking with its hinder legs for a resting place, to enable it to get wholly on to the frail vehicle. The weight of the body of the monster draws the woman backwards—her arms rise with the child: half torn from her, half abandoned, it becomes the prey of the ravening beast, which hastily carries it off into the forest. Exhausted, stunned, senseless, she drops the reins, and continues her journey, ignorant whether she is delivered from her pursuers.

Meantime the forest grows thinner, and an insulated farm-house, to which a side road leads, appears at a moderate distance. The horse, left to itself, follows this new path: it enters through an open gate; panting and foaming it stands still; and amidst a circle of persons who crowd round with good-natured surprise, the unhappy woman re-

covers from her stupefaction, to throw herself, with a loud scream of anguish and horror, into the arms of the nearest human being, who appears to her as a guardian angel. All leave their work—the mistress of the house the kitchen, the thresher the barn, the eldest son of the family, with his axe in his hand, the wood which he has just cleft—to assist the unfortunate woman; and, with a mixture of curiosity and pity, to learn, by a hundred inquiries, the circumstances of her singular appearance. Refreshed by whatever can be procured at the moment, the stranger gradually recovers the power of speech, and ability to give an intelligible account of the dreadful trial which she has undergone. The insensibility with which fear and distress had steeled her heart, begins to disappear: but new terrors seize her—the dry eye seeks in vain a tear—she is on the brink of boundless misery. But her narrative had also excited conflicting feelings in the bosoms of her auditors; though pity, commiseration, dismay, and abhorrence, imposed alike on all the same involuntary silence. One only, unable to command the overpowering emotions of his heart, advanced before the rest—it was the young man with the axe: his cheeks were pale with affright—his wildly-rolling eyes flashed ill-omened fire. “What!” he exclaimed; “three children—thy own children! the sickly innocent, the imploring boy, the infant suckling, all cast out by the mother to be devoured by the wolves!—Woman, thou art unworthy to live!” And at the same instant, the uplifted steel descends with resistless force on the skull of the wretched woman, who falls dead at his feet. The perpetrator then calmly wipes the blood off the murderous axe, and returns to his work.

The dreadful tale speedily came to the knowledge of the magistrates, who caused the uncalled avenger to be arrested and brought to trial. He was of course sentenced to the punishment ordained by the laws; but the sentence still wanted the sanction of the emperor. Alexander, the splendour of whose virtues is only rendered more conspicuous by the throne, caused all the circumstances of this crime, so extraordinary in the motives in which it originated, to be reported to him in the most careful and detailed manner. Here, or nowhere, he thought himself called on to exercise the godlike privilege of mercy, by commuting the sentence passed on the criminal, into a condemnation to labour not very severe; and he accordingly sent the young man to the fortress of Dunamunde, at the mouth of the Duna, in the Gulf of Riga, there to be confined to labour during his majesty's pleasure.

Extract from the New Translation of Tasso's Jerusalem,

BY THE REV. J. H. HUNT.

Single Combat between Tancred and Clorinda, the heroine, whom he loves.

So, while the tumult with the Night conspir'd
To aid her fraud, the wily maid retir'd.
Tancred alone observ'd the intrusive Dame;
Late to the scene of fight the warrior came,
What time bold Arimon her arm subdued;
He saw, he mark'd, and close behind her stood,
Eager her might to prove; a gallant Knight
Deem'd her his peer, nor scorn'd an equal fight.

The Dame, detected, sprang away; in haste
Around the hill her circling path she trac'd,
And at some other portal hop'd to find
Entrance secure; still closely prest behind
The impetuous Chief; and soon, so loud, so near,
The clang of arms alarm'd her startled ear,
That facing round, "What would'st thou here?" she cried:
"Battle and death," the Latin Prince replied;
"Battle and death," the maid rejoin'd, "be thine;
Thyself demands, nor to refuse is mine."
Then planting firm her foot, she waits the fight:
Scorning unequal terms, the Christian Knight
On foot, dismounting from his courser, stands;
The adverse champions wave their flashing brands;
Each dares his foe, as valour, wrath inspire,
Their mutual pride they rouse, and wake responsive ire.
Thus meet two furious bulls, and thus engage,
Inflam'd with jealousy, and wild with rage.
Worthy some theatre's applauding scene,
Worthy the brightest sun, their deeds had been:
But thou, dun Night, whose deep and silent womb
Involv'd them in impenetrable gloom,
Forgive me, if I rend thy veil in twain,
And from the dark recesses of thy reign
Snatch forth those deeds of hardihood, and give
Through ev'ry future age, their fame to live:
Then, deathless as their glory, shall be made
Th' eternal mem'ry of thy sacred shade.

Not once drew back, nor shrunk, those gen'rous foes,
Nor strove to fence, nor ward their mutual blows.
Dexterity and skill are banish'd far;
No time is now to try the tricks of war;
Promiscuous fury, and the gloom of night
Render art useless, and confound the fight.
At ev'ry stroke that falls, with horrid crash
Against the meeting steel their falchions clash.
Where first their feet were planted, firm they stand;
Unmov'd each foot, but restless is each hand,
And as their wheeling blades are ply'd amain,
Nor forward thrust is made, nor stroke descends, in vain.
Scorn and disdain provoke their mutual ire,
And keen revenge adds fuel to the fire:
To efforts new, incentives new provoke,
Nerve their stout arms, and sharpen ev'ry stroke.
More hot th' advancing strife each moment glows,
And fiercer, as it burns, and sturdier grows:
And now, intent on nearer war alike,
No longer with their trenchant blades they strike,
But with the hilts commence more savage fight;
Their bucklers close, their locking helms unite.
Thrice did the Latin Prince, with straining grasp,
In his strong arms the martial damsel clasp;
As oft, elapsing from his nervous hold,
The skilful maid escap'd the iron fold;
What strange embrace was hers that hour to prove!
The fold of savage hate, and not of love!
Again their swords with one consent they try;
Oft in each other's blood the steel they dye,
Till faint at last, and weary, they retire,
And breathless, from the work of death respire.
While thus the combat in suspense remain'd,
Each on his falchion's hilt his weight sustain'd:
But now the last faint star's expiring ray
Withdrew, extinguish'd by the dawning day,

Which in the east its rosy glow display'd;
 His rival's blood the Christian Knight survey'd,
 That down her armour roll'd its torrent red;
 Himself meanwhile with less profusion bled.
 With pride and joy his conscious breast swell'd high;
 Oh! short-liv'd joys of frail Humanity,
 By ev'ry varying breath of Fortune tost!
 Wretch that thou art! whence comes thine ill-timed boast?
 Sad shall thy triumphs prove, thy gladness vain!
 Thine eyes (if still in life thou dost remain)
 Thy sorrowing eyes shall pay, how vast arrears!
 For ev'ry drop of blood, a sea of tears!

Thus pausing a short space, the champions stood,
 And each his valiant foe in silence view'd.
 Tancred at last the awful stillness broke;
 Longing to learn his rival's name, he spoke:

"Our fates ordain, that to the Night alone,
 Unheard, unseen, our prowess must be shown.
 But since harsh Fortune, envious of our fame,
 That praise denies, our deeds might justly claim,
 Thy name, thy state, thy rank, I pray, declare,
 If savage war admittance leaves to pray'r:
 Thus much vouchsafe, that I at least may know,
 Who, in this contest, is the noble foe,
 Whose valour, whichsoe'er may be my doom,
 Must gild my laurels, or adorn my tomb."

"In vain thou ask'st," the haughty Dame replied,
 "What custom, long observ'd, still bids me hide.
 But whatsoe'er my name, before thee stands
 One of that vent'rous pair, whose fearless hands
 Consum'd your boasted tow'r." With fierce disdain
 The gallant Tancred heard her boastful strain.
 "In evil hour," return'd th' indignant Lord,
 "Thy lips gave utterance to that fatal word.
 Alike thy silence and thy speech require
 A full revenge, and whet my righteous ire."

Again in each brave heart new anger burn'd;
 To each exhausted frame new strength return'd.
 Oh! cruel fight! where art, by both disdain'd,
 Was banish'd far; where strength no more remain'd;
 Where desp'rate rage the place of each supplied,
 And singly gave what force and skill denied!
 And oh! where'er their lifted swords descend,
 What gaping, bleeding wounds ensue, to rend
 Their arms, their flesh! and if each feeble frame
 Might still retain the spark of vital flame,
 'Twas gen'rous wrath held back, and wrath alone,
 The subtle spirit in the breast, its throne.
 As, when the North or South winds cease to rave,
 That vex'd of late the wild Egean wave,
 Yet not the more the troubled waters cease,
 Nor the rough surface sinks, becalm'd, to peace;
 Their impulse strong the billows still retain,
 And still with big commotion heaves the main;
 So though the nervous vigour liv'd no more,
 With which each arm assail'd its foe before,
 Yet energy exhaustless still they show;
 This props each champion still, this makes him scorn his foe.
 But lo! the fated moment now was come,
 The moment, charter'd with Clorinda's doom:
 Great Tancred's sword her beauteous bosom tore;
 Deep lodg'd the greedy blade, and drank her virgin gore:
 Her robe, of golden tissue, that repress'd
 Th' ambitious heavings of her snowy breast,

With the warm stream was filled; cold death assail'd
Her bloodless frame; her languid footsteps fail'd:
Tancred with threats the falling fair pursues,
His conquest urges, and his blow renews.
She raises, as she falls, her voice of wo,
And from her lips life's latest accents flow,
Th' infusion of the Spirit from on high,
Spirit of Faith, of Hope, of Charity!
New virtue, by the Almighty Father giv'n;
For if in life she spurn'd the laws of Heav'n,
He will'd at least, that in her dying hour,
Her contrite soul should own her Saviour's pow'r.

"Friend, I am conquer'd; thou hast pardon free,
And pardon I demand in death from thee;
Not on this frame, which no base fear can know,
But on my parting spirit mercy show:
'Tis for my sinful soul I bid thee pray;
Let rites baptismal wash my guilt away."

From her pale lips these languid words that fell,
Such sweetness breath'd, divine, ineffable,
As to the hero's heart resistless crept;
His enmity was hush'd, his anger slept,
And straight, compell'd by some mysterious force,
Unbidden tears gush'd copious from their source.
Emerging from the hill, a scanty brook
Not far remote its murmur'ing progress took:
Thither the soul-struck warrior ran, to fill
His hollow helmet at the limpid rill,
Then hasten'd to perform the sad demand;
Some conscious instinct shook his trembling hand,
As from her face, till now unknown, he drew
The helm that cover'd it; he saw, he knew:—
All pow'r of speech, of motion, then was gone;
Ah! cruel sight! oh! knowledge, best unknown!
Nor yet he died; in that momentous hour,
Collecting all the remnant of his pow'r,
Deep in his soul his sorrows he suppress'd,
And for the solemn office arm'd his breast,
That she, whom late his murder'ous steel had slain,
By water's saving pow'r might live again.
As from his tongue Salvation's accents came,
New joy transform'd the virgin's dying frame;
A smile of gladness o'er her features past,
And sweetly tranquil, as she breath'd her last,
She seem'd to say, "Earth's vain delusions cease;
Heav'n opens on my eyes; I part in peace."
O'er her fair face death's livid hue arose;
So mix'd with violets, the lily shows.
She fix'd her eyes on Heav'n; the sun, the sky,
Seem'd to look down in pity from on high:
She wav'd her hand, and since her lips denied
All pow'r of speech, the pledge of peace supplied.
So past from earthly scenes the maid forgiv'n;
So her pure spirit fled, redeem'd, to Heav'n;
Not death's rude hand her features fair imprest,
But the calm slumber of unclouded rest.

But when he saw her noble life was o'er,
His borrow'd firmness he retain'd no more,
And wild and desp'rate grown, th' ungovern'd chief
Gave loose to all the torrent of his grief:
Close round his heart the stifling sorrow twin'd,
And in such narrow space his life confin'd,
That on his alter'd face the stamp of death
Was fix'd; his senses fled; his languid breath

Scarce heav'd; all spoke him dead—his ebbing blood.
 His pallid hue, his silence, attitude :
 And sure his life, thus struggling to depart,
 Had burst the chain that bound it to his heart,
 And followed the pure soul that late had spread
 Its liberated wings, and heavenward fled,
 But to the spot, by Fortune's guidance brought,
 A Christian squadron came ; the stream they sought,
 By want of water led ; these rais'd with care
 The half-dead warrior, and the lifeless fair.
 Though yet at distance great, their leader's eyes
 The Latin Prince's armour recognise ;
 He hasten'd to the spot, and soon he knew
 The slaughter'd fair, and sadden'd at the view :
 Unwilling that of fun'ral rites bereav'd,
 The beauteous Pagan (as he still believ'd)
 Should lie neglected, to the wolves a prey,
 He bade his train each bleeding corse convey,
 Then took to Tancred's tent his pensive way. }
 So slow they mov'd, such easy steps they took,
 Not wholly from his trance the Knight awoke,
 Yet sighs, and feebly utter'd groans declare
 That some faint sparks of life still linger'd there.
 The other's silent, stiff'ning corse made known
 That all the vital spirit thence had flown.
 Thus, side by side, each pallid corse they bear,
 And in distinct apartments place with care.

FROM THE NEW MONTHLY MAGAZINE.

THE SILENT RIVER: A DRAMATIC SKETCH.

Luke (the natural and deserted son of Lord Rayland) having been reduced to the low occupation of a fisherman for the support of his wife, and failing in this last attempt, is driven to the commission of robbery: the dread of detection hurries him from this to the commission of suicide. In the following scene he is taking his wife to the protection of a friend, preparatory to the last act.

LUKE and MARY in a boat. *The scene varying according to the dialogue.*

Mary. Be cautious, Luke ; I do not love this dark
 And sluggish river, which divides its banks
 With such unequal treachery of depth
 And horrid silence. Often as I've cross'd
 The old worm-eaten bridge of tottering planks,
 Which we just see against the deep blue distance,
 I've thought of thee and thy adventurous toil,
 And then how stillly it would hush the cry,
 And hide the secret, unresisting corse !
 Oh, it is fearful, and (but it is fancy)
 All things seem fearful here !—E'en thou, dear Luke,
 Look'st gloomily and speechless. Pray thee talk ;
 I cannot bear this silence, only broken
 By thy dull plash, and the dead, heavy plunge
 Of water vermin in the oozing slime.

Luke. Thou'rt new to it—but I have breathed too long
 These muddy vapours for our daily morsel
 To heed the stillness of the summer dawn
 Or storm of wintry midnight. My poor Mary,
 Thou'st paid the penalty of thoughtless love
 Dearer than most. Well dost thou know the tone
 Of the chill blasts, when they howl round the cabin

And find the inmate lonely and desponding !
Well dost thou know the tear of bitterness,
When he whose absence thou hast sat lamenting
Returns o'erpower'd with fasting and fatigue,
Drench'd with the rain, or shivering with the icicles
Which cling to him with rattling misery :
And well, O well, my Mary ! hast thou felt
The pang, when he to whom thou'st rush'd for comfort
With harsh despair repell'd thee from his arms,
To mutter sternly of successful toil
And present famine !

Mary. Why recall such times ?

Dear Luke, I never murmur'd for myself,
Neither must thou ; for when I see thee smile,
Our wants seem trifling payments for such bliss,
And I have thank'd the Heavens which granted it,
And pray'd that if a richer change of fortune
Would change thy love, we still might live in want.

Luke. Yes, thou hast pray'd—'tis good—thou hast pray'd much—
I've watch'd thee in thy sleep, when thy white temples
Press'd the coarse pillow with as patient innocence
As if 'twere made for them—I've watch'd thee then,
With thy small fingers clasp'd upon thy breast,
And moving lips which show'd thou dream'dst of prayer,
And thought that I, too, once was used to pray,
But fortune only grew more merciless,
And so I ceased.

Mary. O, say not—say not so !
My greatest comfort was to think that Heaven
Guarded the perils which were enforc'd by love,
For then the storm about thy houseless head
Lost half its fury.

Luke. It will rage no more.
At least I shall not hear it, Mary.

Mary. No.
For thou hast promised ne'er to leave thy rest
At such dire seasons.

Luke. I have promised thee,
My tender, gentle, most beloved Mary.

Mary. Come, thou art sad.—Look, how the first faint ray
Of morn hath started the old querulous owl
Amidst his dull and devious wanderings !
He hath made straight towards the village barn,
'Plaining as if he groan'd at his long journey
Across the marsh, which, seen between the twigs
And leaning trunks of these deserted willows,
Seems boundless in its flat and hazy empire.
And see, the heron, with his broad blue sails,
Wheels downwards to succeed the bird of wisdom.
O, long-neck'd felon ! That hoarse shout of his
Is meant to tell thee thou'rt no fisherman.
Thou'lt soon be back to try thy skill with him ?
Thou said'st to-morrow,—thou'lt not break thy promise ?

(Sings.)

"He bade me adieu, and he vow'd to be here
When swallows came down the green ;
But the leaves of the Autumn are scatter'd and sere,
And home he hath never been."

Oh, and is that the tale ! then hear what follows,—

(Sings.)

"So under the wave and under the wave,
Beneath the old willow tree."
Mind—mind, dear Luke, your pole will scarcely touch
The bottom ! You were almost overbalanced.

*The Silent River,**(Sings.)*

"With the weeds for my pall, in a deep, deep grave,
Shall my false love find me."

Why didst thou start?

Luke. I almost ran upon
Wild Martha's willow-tree, e'en whilst you sang
Of it.

Mary. Was that it, Luke? How horribly
Your words have made it look! I could stay now
And speculate on its fantastic shape
Most learnedly. That broad and gnarled head
Crown'd with its upright, spiky stubs, and frowning
Between two mighty sockets, where the wrens
Have built their nests, hath weigh'd its scathed trunk
Aslant the pool, o'er which two stunted branches,
Curling to claws, complete a ramping lion,
Prepared to plunge on all who dare invade
Wild Martha's secret cell. There is a legend,
How, tangled in the roots, she still remains
And tears the fisher's nets in the vain struggle
To gain her freedom. Poor, distracted Martha!
She must have been sore used to do such crime!

Luke. 'Tis a hard name which thou hast learned, my Mary,
For that which, harming none, is the sole means
To free the wretch from misery. Methinks
Wild Martha sleeps as soundly in her cave
As those who rot beneath yon fading steeple—
Some for their lives were happier, and some—
For they lack'd courage so to end their griefs.

Mary. Thou never spokest unkindly, and wouldst fain
Excuse what inwardly thou'rt shuddering at.
Dost thou forget how often thou hast told me
How thy stout heart hath quail'd to pass yon tree
At midnight? If thou thought'st the hapless girl
At rest, thou hadst not fear'd. Dost thou remember too
That April Sunday, when the young violets
First peer'd between the moss upon the graves,
How long we saunter'd 'mongst the velvet hillocks,
Conning rude epitaphs, and moralizing
In sweetest melancholy? How we linger'd
Upon the humble bed of good old Adam,
The village patriarch, who, from lowliest state,
Had labour'd on to unpretending comfort,
And left it to his children's children? Oh,
How thou didst reverence that place, and hope,
Like him, to struggle with thy days of trial;
Like him to sleep the sleep of those who meet
Those days un murmuring. *(Luke shows much emotion.)*

What, Luke! dear Luke!

I've been too heedless in my pensive talk,
And thought not of thy present grief.

Luke. And still
Forget it, Mary. I was only musing,
If, tempted to the act of her whose bones
When skies are clear may be discern'd far down
In their strange prison playing with the eddy,
I should be left a like unhallow'd empire
Of fear and utter loneliness. Wouldst thou
Ne'er visit the neglected spot which took
The latest of thy husband's living looks?
Wouldst thou refuse to commune with his spirit,
And say thou'st bought his pardon with thy prayers?
There is no grief, in all the world, could sit
So heavily upon my hour of death

As doubt that thou might'st dread my memory,
And shed no tear o'er him who loved thee so.

Mary. Thou reveller in woes impossible!

Luke. But tell me truly.

Mary. I'll not answer thee;

Indeed I will not, Luke: it is not well
To pay Heaven's bounty with such fearful fancies.

Luke (after a pause). Well, then, suppose me laid beside old Adam,
With decent holiness: what wouldst thou do
To live, my helpless Mary?

Mary. Oh, I never

Took joy in making misery for thee!

Luke. I'd have thee go directly to the home
From which I bore thee. Tell thy angry friends
That he who tempted thee to thy offence
Toil'd night and day, 'till often his worn sinews
Refused to obey him, for thy maintenance.
Tell them he loved thee, never used thee ill;
And ne'er had sent thee back to them to beg,
Had Fate not frozen up his willing hand.
They will have pity and receive thee, Mary,
When I am gone.

Mary. When thou art gone! O, then

I shall not need more kindness at their hands
Than will suffice to lay me by thy side.
But wherefore, Luke, when thou'rt about to leave me,
And journey, as thou say'st, to a far place—
Wherefore so wilful in thy wild endeavours
To make me weep more sadly o'er thy absence?
Thou wilt have tears enough.

Luke. Nay, keep them now.

The moment's not yet come which calls for them.
This turn hath brought us where we bid farewell,
And Caleb waits to help thee on the bank.
Good, honest Caleb! that small hut of his
Shelters a world of most industrious virtue!
All things seem smiling round him: the huge elm
Spreads his arms o'er him with parental fondness,
And ev'ry day puts forth a livelier green.
The waving osiers which enclose his path
Appear to spring more lofty and elastic
Because his hand hath pruned them. All the hues
Of his small garden-patch look healthily,
As if a blessing were upon them. All
His nets, which waver, drying, in the air,
Tell how that cheerful home was earn'd, and prove
No labour, that is honest, is too humble
To gain the smile of Providence.

Mary. How bless'd

Am I to hear thee say so! for it shows
Thou hast forgot thy ill-conceal'd despair,
And in good Caleb's meek prosperity
Foresee'st our own. Nay, 'tis begun already
In thy poor friend's bequest.

Luke. Farewell, dear Mary!—

Here we must part. [They land opposite Caleb's cottage.

LUKE, MARY, CALEB.

Caleb. Welcome, friend Luke, and you,

My precious charge. Right glad am I to see
So sweet a face beneath my roof again.

Mary. Thanks, Caleb, thanks.

Luke. I need not tell thee, Caleb,
How much thou hast of my good thoughts; here is

The Silent River.

A proof thou canst not doubt—it is my all.

[*Delivering Mary to him.*]

Caleb. It were no lack of hospitality
Were I to hope so questionless a pledge
Of thy good will might quickly be redeem'd.
Mary. Ay, tell me, Luke, when shall we meet again?
An hundred times I have besought thee fix
Thy earliest day, and thou as oft hast turn'd
To other things, as if that meeting had
No joy for thee.

Luke. O, when we meet again,
'Twill be in joy, indeed!

Mary. And will it so?
But when—but when, my Luke? To-morrow? No.
'Twill surely be the next day.

Luke. Be content:
Ere then I shall be watching o'er thee.

Mary. Thanks,
Thanks, thanks, O, thanks! Why, if it be so soon,
I shall have scarcely time to shed one tear,—
That is—after my foolish eyes are dried.
Good Caleb, I'm ashamed to see you smile:
'Tis our first parting. Do not chide me, Luke;
I cannot help it. [*Falling on his neck and weeping.*]

Luke. Chide thee, my poor girl!
I am too ready in the same offence.
But now farewell! Until we meet again
I'd have thee pass thy time in thinking over
All that I said to thee upon our way.
Thou wilt?

Mary. Indeed 'twas very melancholy.

Luke. But say thou wilt.
Mary. I shall not soon forget.
But why art thou so earnest?

Luke. Heed it not.
Thou knowest I have that which makes me sad,
Perhaps I'm selfish, and would have thee share
My heaviness. So now, once more, farewell!

Mary. Adieu, my Luke!

Luke. Caleb, your hand.

Caleb. God speed
Your journey, Luke!

Luke. I hope he will.—My Mary,
One other kiss; which I will keep most holily
E'en to my bed of death.

[*He re-enters his boat and pushes off, CALEB and MARY looking after him, till an angle of the river brings him upon a new scene.*]

So now 'tis past!

Poor widow'd Mary, we shall meet no more!

[*The river becomes wider as he proceeds, and at last expands into a large circular pool. He rests upon his pole, and looks slowly and cautiously about him.*]

This is the place.—How fitting for a deed
Like mine! The high and shelving banks have nursed
With their moist clay this fringe of bulrushes
To an uncommon growth, as if to hide
All eyes from me, and me from all the world.
The sun did leap aloft an hour ago,
But here he hath not been—'tis scarcely twilight,
And very, very silent! How my breath
Clings to my heart, like the affrighted infant
Which struggles closer when its parting's nigh!

I must be quick.—And now that single ray
 Points, like a dial, to the very spot!
 There the huge whirling eddy in its round
 Comes to its dimpled centre, and glides down
 To unknown depths, bearing whatever floats
 Within its verge in less'ning circles, like
 The eagle wheeling round his prey, until
 It darts on death. The strongest swimmer here
 Must ply for life in vain! Many are here,
 From chance or choice, who long have lain in secret
 From weeping friends and wives, as I shall do,
 Leaving no thing but vague surmise behind.
 I'll find their mystery.

(He pushes the boat into the middle of the pool, and then, laying down his pole, sinks upon his knees.—The scene closes.)

THEORY OF EARTHQUAKES.

M. BIOT, after detailing the phenomena of the earthquake, concludes an interesting paper with these observations:—

In the infancy of Chemistry and Natural Philosophy, it was imagined that earthquakes might be easily explained; in proportion as these sciences have become more correct and more profound, this confidence has decreased. But by a propensity for which the character of the human mind sufficiently accounts, all the new physical agents which have been successively discovered, such as electricity, magnetism, the inflammation of gases, the decomposition and recomposition of water, have been maintained in theories as the causes of the great phenomena of nature. Now all these conjectures seem to be insufficient to explain convulsions so extensive, produced at the same time over such large portions of the earth, as those which take place during earthquakes. The most probable opinion, the only one which seems to us to reconcile, in a certain degree, the energy, the extent of these phenomena, and often their frightful correspondence in the most distant countries of the globe, would be to suppose, conformably to many other physical indications, that the solid surface on which we live is but of inconsiderable thickness in comparison with the semi-diameter of the terrestrial globe; is in some measure only a recent shell, covering a liquid nucleus, perhaps still in a state of ignition, in which great chemical or physical phenomena operating at intervals cause those agitations which are transmitted to us. The countries where the superficial crust is less thick or less strong, or more recently or more imperfectly consolidated, would, agreeably to this hypothesis, be those the most liable to be convulsed and broken by the violence of these internal explosions. Now if we compare together the experiments on the length of the pendulum, which have been made for some years past with great accuracy, from the North of Scotland to the South of Spain, we readily perceive that the intensity of gravitation decreases on this space, as we go from the Pole towards the Equator, more rapidly than it ought to do upon an ellipsoid, the concentric and similar strata of which should have equal densities at equal depths; and the deviation is especially sensible about the middle of France, where too there has been observed a striking irregularity in the length of the degrees of the earth. This

local decrease of gravity in these countries should seem to indicate, with some probability, that the strata near the surface must be less dense there than elsewhere, and perhaps have in their interior immense cavities. This would account for the existence of the numerous volcanoes of which these strata show the traces, and explain why they are even now, at intervals, the focus of subterranean convulsions.

June 13.—M. Thollard, of Tarbes, states, that he had observed a ray of the sun after a shower of rain of a certain duration, falling upon an ear of rye, was sufficient to cause the membrane of the anther enclosing the small vessel containing the pollen, to burst like a pod. This phenomenon may render our information concerning the smut complete. Experiments on this subject should be encouraged.

Number of the known Species of Organized Beings.—From the collections in the Paris Museums, M. Humboldt estimates (*Ann. de Chimie*, xvi.) the known species of plants at 56,000, and those of animals at 51,000; among which, 44,000 insects, 4,000 birds, 700 reptiles, and 500 mammalia. In Europe live about 400 species of birds, 80 mammalia, and 30 reptiles; and in the opposite southern zone on the Cape, we find likewise almost five times more birds than mammalia. Towards the equator, the proportion of birds, and particularly of reptiles, increases considerably. However, according to Cuvier's enumeration of fossil animals, it appears that in ancient periods the globe was inhabited much more by mammalia than birds.

Papyri of Herculaneum.—Sir H. Davy's experiments on the Papyri have closed without producing any marked result. Iodine and chlorine separated the rolls without injuring the ink, which is of charcoal, on which these agents have no action; but the Papyrus itself, containing much undecomposed vegetable matter, baffled the investigation. Of the original 1696 MSS. 431 have been submitted to experiment, or given to foreign governments, by the king of Naples: about 100 of those which remain appear to be in a state to encourage the expectation of their being restored even by the chemical means already known. In general the writing is only on one side, and the MSS. are rolled round sticks, like the webs of our silk mercers. The stick is invariably carbonized, and resembles a bit of charcoal. Sir H. D. suggests, from the nature of the ink on these MSS. and the silence of Pliny, that up to this period the Romans never used galls and iron as a writing ink, and probably that this invention was contemporary with the use of parchment, of which the earliest MSS. at present known are the Codices Rescripti, discovered at Rome and Milan, by M. Mai, including the books of Cicero de Republica, supposed to be of the 2d or 3d centuries.

Colouring Matter in Crabs, Lobsters, &c.—It appears, from a series of experiments made by M. J. L. Lassaigne, that crabs, lobsters, &c. contain a red colouring principle, which may be extracted by means of alcohol.—That this colour is not formed by the action of heat, but developed in the shell by the impulsion of that fluid.—That there exists in that class of animals a highly coloured membrane, which appears to be the source of the colouring matter, which is insoluble in cold or boiling water, but soluble in sulphuric æther and pure cold alcohol.